MONTHLY BULLETIN

OF THE

INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

(ENGLISH EDITION)

PUBLISHING and EDITORIAL OFFICES: 231, RUE ROYALE, BRUSSELS.

Yearly prepaid subscription { **Belgium . . . . . 70 Belgas** / **Other countries . . 75 Belgas** } including postage

Price of this single copy: 8 Belgas (not including postage).

(1 Belga = 5 Belgian francs.)

Subscriptions and orders for single copies (January 1931 and later editions) to be addressed to the General Secretary, International Railway Congress Association, 231, rue Royale, Brussels (Belgium).

Orders for copies previous to January 1931 should be addressed to Messrs. Weissenbruch & Co. Ltd., Printers, 49, rue du Poinçon, Brussels.

Advertisements: All communications should be addressed to the Association, **231, rue Royale, Brussels.**

CONTENTS OF THE NUMBER FOR JUNE 1938.

CONTENTS.	Page.
I. **THIRTEENTH SESSION, PARIS 1-12 JUNE, 1937.**	
General Proceedings in Sections and in Plenary Meetings.	
4th Section. — General.	
Inaugural Meeting of the 4th Section	549
QUESTION X. — **Effects of the world crisis and road competition on the railway position.** Corresponding changes in the railway commercial policy . . .	551
QUESTION XI. — **Selection, orientation and instruction of railway staff** . . .	602
5th Section. — Light railways and colonial railways:	
Inaugural Meeting of the 5th Section	617
QUESTION XII. — **Co-ordination of operation as between main-line and light railways**	620
QUESTION XIII. — **Specifications for the fixed plant of railways with light traffic,** intended to prevent the use of unnecessarily expensive track equipment, and generally to give economical working	632
A **« circle-nomogram » for the « axle-spacing » formulæ** of the Central European Railways Association, by Alexander FISCHER	642
Alinement chart for the determination of the loss of time of passenger trains, due to reduction of speed, on the level, by R. L. DEVOOGHT	645

CONTENTS (*continued*) | Page.

IV. The « Joosten » **process of consolidating and sealing permeable soil,** by Dr. A. KARSTEN 651

V. NEW BOOKS AND PUBLICATIONS :

Alphabetisches Ortsverzeichnis (früher Dr. Koch's Ortsverzeichnis). [*Alphabetical List of Places* (former Dr. Koch's List)]. Twentieth Edition. Published by the CENTRAL EUROPEAN RAILWAYS ASSOCIATION 655

Elsners Taschenbuch für den Bautechnischen Eisenbahndienst (*Elsner's Permanent-Way Handbook*). 1938, 16th year 655

Elsners Taschenbuch für den Werkstätten und Betriebs-Maschienendienst bei der Deutschen Reichsbahn (*Elsner's Handbook for the locomotive and rolling stock department and repair shops of the German State Railways*) . 656

VI. MONTHLY BIBLIOGRAPHY OF RAILWAYS 73

LIBRARY

OF THE

Permanent Commission of the International Railway Congress Association.

READING ROOM : **231, rue Royale, Brussels.**

Works in connection with railway matters, which are presented to the Permanent Commission, are mentioned in the « Bulletin ». They are filed and placed in the library. If the Executive Committee deems it advisable they are made the subject of a special notice. Books and publications placed in the reading room may be consulted by any person in possession of an introduction delivered by a member of the Association. Books, etc., may not be taken away except by special permission of the Executive Committee.

The Permanent Commission of the Association is not responsible for the opinions expressed in the articles published in the Bulletin.

All original articles and papers published in the BULLETIN are copyright, except with the consent of the Authors and the Committee.

Editions in **French** and in **German** are also published.

Vol. XX. — No. 6. June 1938.

BULLETIN
OF THE
INTERNATIONAL RAILWAY CONGRESS
ASSOCIATION
(ENGLISH EDITION)

[385. (06. 112]

THIRTEENTH SESSION

Paris, 1-12 June 1937.

GENERAL PROCEEDINGS

4th Section : **GENERAL.**

INAUGURAL MEETING

June 2nd, 1937.

PROVISIONAL CHAIRMAN : MR. H. JEZIERSKI,
MEMBER OF THE PERMANENT COMMISSION OF THE ASSOCIATION.

The Meeting opened at 9 a.m.

The Chairman (in French). — Gentmen, the Permanent Commission of the ssociation requested me to preside over e inaugural meeting of the 4th Section, d proposed, as President, Prof. Dr.-Ing. WASIUTYNSKI, Vice President of the echnical Council at the Polish Ministry Communications. *(Applause.)*

(Prof. Wasiutynski then took over the hair.)

The President (in French). — Gentlemen, I am fully alive to the honour you do me, and I thank you. I will do my best to assist in solving the questions before us.

In order to complete the Bureau of the Section, I propose to appoint as *Vice-Presidents :*

Messrs. W. H. BARNES, General European Agent, Pennsylvania Railroad;

G. PANAITOPOL, Assistant General Manager, Rumanian State Railways;

Dr. D. FEZAS VITAL, Director, Portuguese Railways Company;

Mr. DEMARET, Inspecteur principal, Traffic Department, Belgian National Railways Company,

and as *Principal Secretary :*

Mr. A. ALLARD, Manager, Belgian National Light Railways Company.

— *These proposals were greeted with applause.*

— The Section further completed its Bureau and drew up a provisional agenda.

— The Meeting was then closed.

Revision of the Rules and Regulations of the International Railway Congress Association.

— The Meeting was resumed at 9.30.

The President. — Before dealing with Question X, which is the first point of our agenda, it is our task to examine the proposed alterations to articles 2 and 4 of the Rules and Regulations of our Association.

— *The President read the proposed modifications* (*).

As you notice, the aim of these modifications is to simplify the procedure in connection with the admission of new Members, and, for my part, I see no objection to these alterations.

— *(The Section unanimously approved the proposals).*

The President (in French). — In accordance with article 21 of the Rules and Regulations, we have also to appoint a Delegate on the Special Committee who will examine the proposed modifications.

Mr. Jezierski *(Permanent Commission of the Association, and Polish Ministry of Communications).* — I think I will voice the feelings of the whole Meeting in proposing that Prof. Dr.-Ing. WASIUTYNSKI be appointed. *(Applause.)*

The President (in French). — I thank the Meeting for this special mark of sympathy.

— The Meeting then proceeded with the discussion of Question X.

(*) See wording of the proposed alterations in the September 1937 number of this *Bulletin*, p. 1962 (Summary of Proceedings, Paris Congress, 1937), and revised Rules and Regulations in the January 1938 number, p. 98.

QUESTION X.

Effects of the world crisis and road competition on the railway position. Corresponding changes in railway commercial policy.

Preliminary documents.

Report (Four main-line Railways of reat-Britain — affiliated to the Inter-ational Railway Union [U. I. C.] — and ain-line Railways of all other countries, ot affiliated to the International Rail-ay Union), by Mr. ASHTON DAVIES. (See *ulletin*, February 1937, p. 309, or sepa-ate issue No. 17.)

Report (All main-line Railways affili-ed to the International Railway Union [U. I. C.], except the four British main-line Railways), by Dr. COTTIER and Dr. TRIERENBERG. (See *Bulletin*, April 1937, p. 1109, or separate issue No. 30.)

Report (All secondary Railways), by Messrs. LA VALLE and MELLINI. (See *Bulletin*, May 1937, p. 1209, or separate issue No. 32.)

Special Reporter : Dr. COTTIER. (See *Bulletin*, June 1937, p. 1571.)

SECTIONAL DISCUSSION.

Meeting held on June 2nd, 1937.

PROF. DR.-ING. WASIUTYNSKI IN THE CHAIR.

The Meeting opened at 9.30 a.m.

The President (in French). — Gent-men, today we have to discuss Ques-on X. Dr. COTTIER, the *Special Repor-r*, will begin by reading a resumé of e Question and the summaries he wants put before the Meeting.

Dr. Cottier, *Special Reporter* (in rench). — Mr. President, Gentlemen, a result of the decision taken on the th July, 1933, by the Permanent Com-ission of the International Railway ongress Association, the first report out the effects of the world crisis and motor competition on the railways was drawn up in the Autumn of 1934. This was followed by a second report in the Autumn of 1935, and at the present time three new reports are available under the title : « Effects of the world crisis and road competition on the railway position. Corresponding changes in rail-way commercial policy. » To be accurate, the expression « world crisis » no longer meets the case. As early as 1933 or 1934, things began to look up in most coun-tries, and the recovery has become more and more widespread. The full effects of the economic crisis lasted longest in the « gold block » countries, but after

they went off the gold standard, in the autumn of 1936, there was a marked improvement, so that it is no longer true to talk about a world economic crisis. It is still a fact, however, that several railways have not yet succeeded in recovering from the fatal consequences of motor competition on their financial position.

The task of presenting, for the Paris Session, a report covering the Continent of Europe was again entrusted to Reichsbahndirektor VON BECK and myself. Unfortunately it was not given to Herr Von Beck to complete his task, as he died prematurely at the end of last year. Herr Von Beck was thoroughly conversant with the railroad problem; the whole of the second part of the 1934 report, for example, was his own work. His death is a serious loss, not only to the German railways, but for all of us who had the honour of working with him. I count it an honour to have this opportunity of mentionning him and recalling the reputation he gained by his collaboration in the international field, in connection with the question we are now considering.

(The whole Meeting spontaneously rose to its feet to associate itself with the repect paid by Dr. Cottier to the memory of the late Herr VON BECK.

I am delighted to find, however, that the deceased has a worthy successor, equally conversant with the problems we are considering : I mean Dr. TRIERENBERG, Reichsbahnoberrat, with whom I drew up this year's report for Continental Europe and Japan.

The three reports were all drawn up on the basis of a single questionnaire prepared by the Reporters. The latter wish to express their thanks to the many railways which conscientiously answered all the questions and thereby enabled them to collect together much valuable information.

The above mentioned report by Dr Trierenberg and myself deals with the main-line railways of the following countries : France, Germany, Italy, Belgium, Luxemburg, Holland, Switzerland, Portugal, Denmark, Sweden, Norway, Finland, Poland, Czechoslovakia, Austria, Hungary, Jugoslavia, Rumania, Bulgaria and Japan. The information on which we based our report relates therefore to 29 Railway Administrations.

The second report was drawn up by Mr. ASHTON DAVIES, Chief Commercial Manager of the London Midland and Scottish Railway, This was based on information supplied by twenty-five Railway Companies in the following countries : United States of America, Argentine, Ceylon, Egypt, French Indo-China, French West Africa, Great Britain, India, Ireland, Kenya and Uganda, Mozambique, Dutch East Indies and Union of South Africa.

The third report was the work of Messrs. LA VALLE and MELLINI, Chief Inspector and Higher Inspector, respectively, of the General Inspectorate of the Italian Railways, Tramways and Motor Services. It deals with the effects of the economic crisis and motor competition on secondary railways. Out of the 78 questionnaires sent out by these reporters, only twelve were fully answered. The most interesting information was received from the « Régie Départementale des Tramways de l'Ain » (France), from a group of six private railways in Sweden, from the Swedish Union of private railways, and finally from the Mediterranean Railways Company (Italy).

I was asked to prepare a special account from these three reports, in order to sum up their principal contents and summaries.

In the discussions it will be necessary) refer to these reports. In this brief ccount, however, I cannot go into all ıe matters dealt with. I must limit ıyself to a brief resumé of the main ɔints.

Regarding the general economic chan-es and the effects thereof on railway affic, the following points can be put ɔrward : since 1933, the situation has ıproved in an increasing number of ɔuntries, so much so that at the end 1936 it may be called a universal im-ɔvement. World production figures ıve once more risen above the 1929 vel. On the other hand, the exchange goods between states is still hampered import restrictions, the clearing sys-ms in use, regulations about currency change, and uncertainty regarding the onetary situation. The result has been at world trade has not followed, not en from afar, the increase in produc-on during the last few years, and the 929 level has not been reached, neither regards quantity nor value. For this ason the first summary of Messrs. La alle and Mellini's report deserves spe-al attention. It is worded as follows :

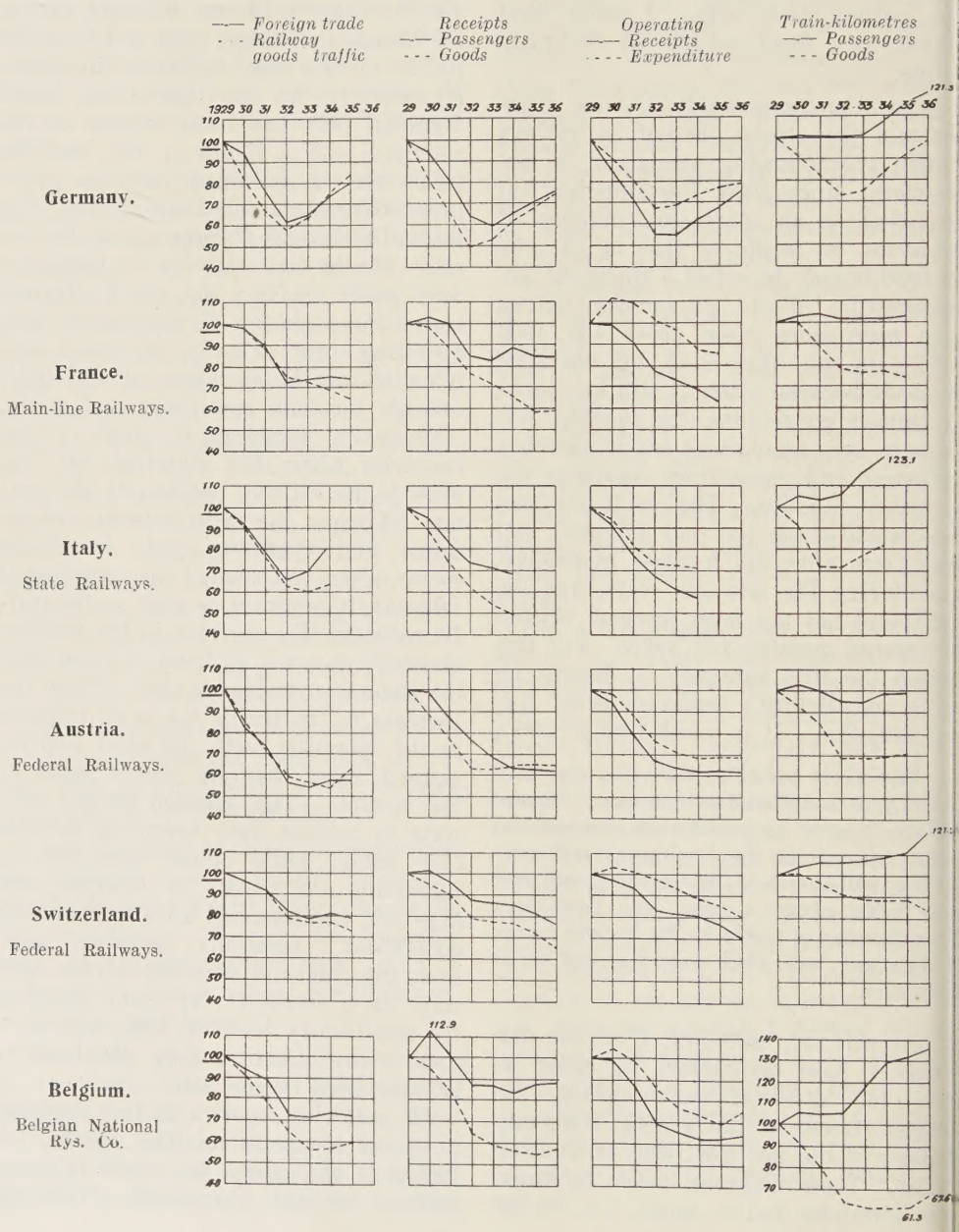
1. The worst period of the crisis may for-nately be considered as now past. Never-eless, it is to be hoped that international ade, freed from the hindrances still pre-iling, will revive to its former extent and us bring about a rapid and permanent tensification of traffic by the various means transport : rail, road, waterway and aerial vigation.

You will see, moreover, from the dia-ams I have distributed in order to ow the situation more clearly, the nter-effects of the general economic anges of the last few years on railway ffic. These diagrams relate to Euro-an countries and to Japan, i. e. to the railways covered by the Cottier-Trierenberg report. There are four diagrams for each country, arranged horizontally. The first shows, by two different curves, the change in foreign trade and in goods traffic on the chief railways (in tonne-kilometres). All the figures are index figures; 1929 has been chosen as the standard with a figure of 100, and the values for the following years are given proportionately to this basic figure. The second horizontal diagram shows the receipts for the main railways for passenger and goods traffic; the third diagram shows the evolution of the receipts and operating costs. Finally, the fourth diagram shows the evolution of the train mileage for both passengers and goods.

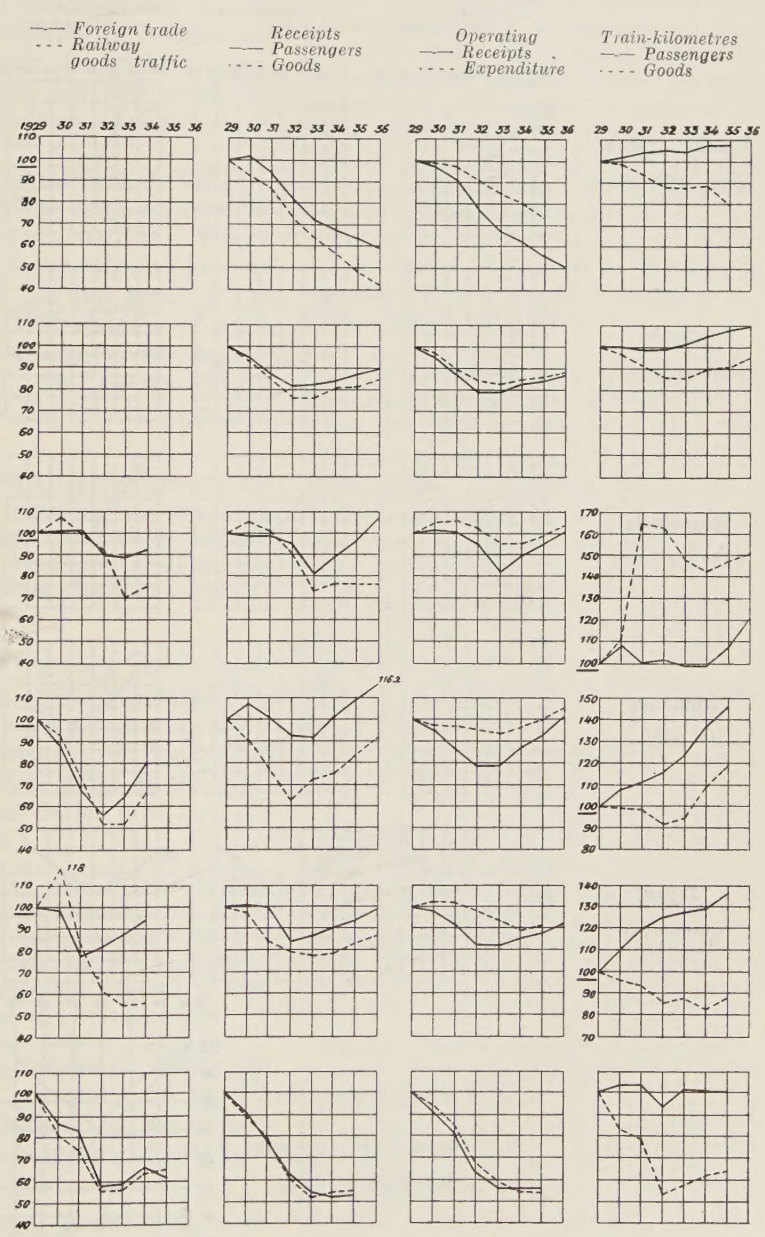
Generally speaking, in most of the countries where the situation has improved, the railway position is also better. Whereas the ratio between the receipts and operating costs is always worse when the use of the equipment falls off, it improves as soon as the traffic recovers. The increase in the receipts generally does not go hand in hand with the amount of traffic carried. When the increase in the traffic led to an increase in the operating costs, the latter still remained lower than the excess value of the receipts. This enabled certain railways to balance their operating deficits once more, while others succeeded in increasing the excess of receipts over expenses, and obtained a better operating coefficient. Generally speaking, however, the financial situation of the railways as a whole is far from reaching the satisfactory level of 1929, and in a great many countries they still have to be subsidised by the State.

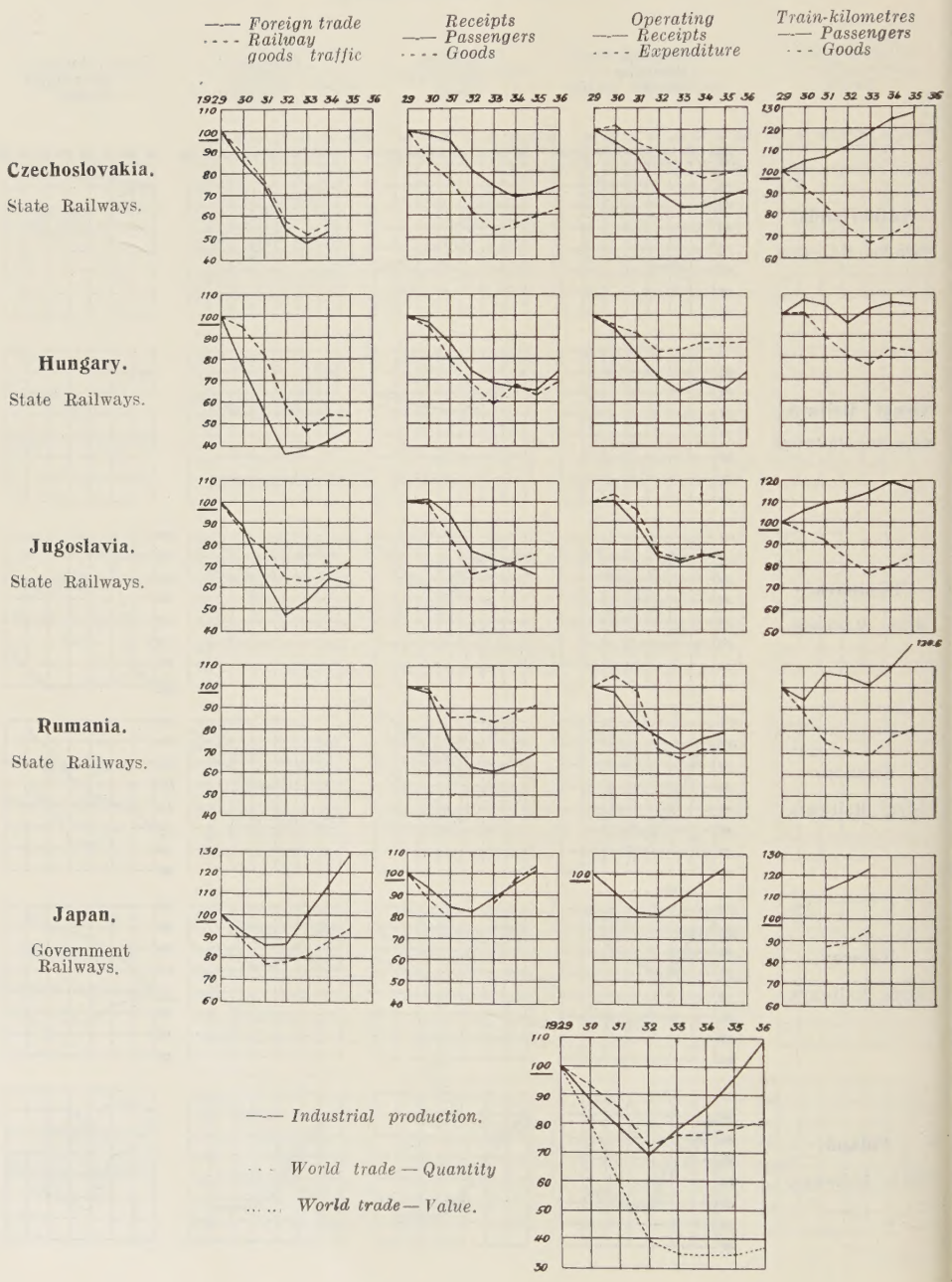
All countries report a further increase in motor competition. The number of lorries is increasing, but what is more serious is their increased efficiency.

Graphs showing the economic development of Railways i



. (Report by Dr. Cottier and Dr. Trierenberg).




Foreign trade
Railway goods traffic
Receipts
Passengers
Goods
Operating
Receipts
Expenditure
Train-kilometres
Passengers
Goods
1929 30 31 32 33 34 35 36
Czechoslovakia.
State Railways.
Hungary.
State Railways.
Jugoslavia.
State Railways.
Rumania.
State Railways.
Japan.
Government Railways.
Industrial production.
World trade — Quantity
World trade — Value.

. Ashton Davies has particularly stres-
l the fact that in England the loading
pacity of lorries has increased by about
% since 1933, which comes to the
ne thing as increasing the number by
e fifth. Wherever the rates for road
ılage services are not laid down by
, there is a tendency to lower them
ll further.

All the reporters have come to the con-
ısion that the State must actively in-
fere in the road-rail conflict. Where
r the situation of the railways has im-
oved during the last few years, it can
ascribed to the slow recovery of trade
d industry rather than to overcoming
tor competition. Mr. ASHTON DAVIES,
wever, has made the following general
nt :

t seems to be beyond dispute that in coun-
es where road transport has not been
ought under appropriate legislative restric-
n, the railways have not obtained the
ximum benefit from the improving in-
strial situation.

Indeed, all the railways have made
eat efforts and been successful in
apting themselves, by reducing their
es, to the increasingly difficult situ-
on they have to cope with. In this con-
ction, Mr. Ashton Davies says, in a ge-
ral way :

t is pleasing to be able to report once
in that railway administrations have
ntinued to pay close attention to the
itation of expenditure, and this commend-
e action has materially assisted in the
eral enhancement of net revenue.

Regarding the principles on which the
ations between rail and road should
legally based, Messrs. LA VALLE and
LLINI made the following interesting
narks :

or the fundamental functions of *mass* transporters and long-distance carriers, railways must be looked upon as the backbone of all means of communication in all countries. All other kinds of transport should be expanded to most usefully meet the requirements of each country taking into account the needs of the various districts, the eventual gaps in railways systems and the aim to be achieved, viz. to render all transport the most economical, rapid and useful for the district served. When competition between rail and road becomes strong, dangerous and anti-economic, the intervention of the Public Authorities is desirable, for imposing regulations to co-ordinate the various means of transport.

In our special report, we stressed the fact that the legislative measures enacted in recent years in many countries have definitely never passed the first experimental stage. The confusion that reigns in this sphere is due above all to the fact that the leading economic centres, and sometimes the Government as well, have failed to recognise the nature and extent of the fundamental problems to be solved. They often start with the false idea that the technical and economic qualities of the two methods of transport are the determining factors, whereas the real causes of the conflict reside elsewhere. In every country the railway is rigorously controlled by the State according to the law, whereas road transport has been left free to develop at will. This has led to falsification of the mutual relations between the technical and economic factors, and the evolution has not been able to follow its natural course.

In the conflict between rail and road, it is the operating methods rather than the technical qualities of the two methods of transport which are opposed. Even technically alone, the railways are a public method of transport. The public character and the regularity of their

operation depend not only on their legal obligations but just as much on their technical nature. Then too, in every country the laws require them to carry out a whole series of public duties. In many countries the State has used the railway as a political instrument, without troubling about its efficiency. For example, the railway is obliged to operate secondary lines which always show a deficit, in order to encourage decentralisation of the economic life of the country, and relieve the congestion in the large centres. The prosperity of more than one area depends on the existence of a railway line unable to meet its actual costs, and living on the surplus from the main lines.

If there is one obligation that falls very heavily upon the railway, it is that it *must* carry; this obliges it to have sufficient stock and staff to meet all rushes of traffic. This involves tying up large capital which only earns a profit at intervals. It is obvious that from the point of view of their operating economy, the railways have no interest in sinking their capital in such a way, but it is necessary for the public good, because it has been recognised that it is very important to be able to meet all peak traffic requirements without let nor hindrance, and the whole economy of the country would be upset if there were no means of transport capable of meeting satisfactorily all the seasonal traffic requirements.

That the railways are at the service of the community is also proved by their rates. The system of *ad valorem* rates is of great assistance to the State in order to decentralise the economic life of the country. It facilitates the transport of raw materials and heavy goods of small value, and owing to the fact that manufactured goods have to pay higher rates, it acts as a protective duty in the case of industries and artisans working at a distance from the important centres of production and delivery of raw materials. For this reason the railway rates have been largely subordinated to the economic policy of the State. Obviously rates established on such a basis must be stable and certain. There must not be frequent changes to suit the momentary interests of the railway.

It was relatively easy to impose all these duties on the railways in view of the fact that they are important undertakings and can look for financial compensation in fields where the national economy is not concerned. But this presupposes that such compensation will not be made impossible owing to a competition which takes away all the paying traffic.

Now, the motor lorry introduced such competition. As this new method of transport made it possible to set up small transport firms operated by the owner, it is above all an individual method of transport, and as such it is not easy to bring it under legal obligations. It is this contrast between public traffic and private traffic which makes it so hard to solve the transport problem. Two important questions arise in this connection :

(1) How can the new method of transport be incorporated in the existing system of public transport services ?

(2) How should the relations between private traffic, of recent origin, and public traffic, be regulated ?

It is required of public traffic that it should be regular, that its rates should be fixed, and its operation offer every security. If such obligations were imposed on a motor transport firm, this also would find itself at a disadvantage vis-à-vis private traffic, which would

y keep the paying kinds of transport. f motor transport is incorporated in public traffic system, the question es to what extent the railways are to re in road transport. Messrs. LA VALLE l MELLINI have a particularly interest- summary about this :

Vhen the requirements of a district de- nd the simultaneous presence of public nsport by rail and by road, concentration he whole traffic in the hands of a single npany is advisable. In any case, certain ondary trains carrying light traffic may advantageously replaced by road motor nsport.

The railways can indeed use road nsport to replace certain trains, but y can use it above all to complete ir system. As a rule door-to-door vices are only possible with the assist- e of the motor lorry. Such services essential today. For this reason, re is not a single railway company ich is not giving careful attention to s matter. It is very desirable there- e, that the railways should have full ntrol of these supplementary lorry ser- es, either by operating them them- ves, or by setting up affilated under- ings, or by making agreements with vate firms. In this way, instead of ng merely railway companies, the rail- ys will become vast public transport dertakings. By making use of the mo- themselves, it will also be possible for m to reap many of the advantages of vate individual traffic; for example, e the German Reichsbahn, they might ept orders for transport. By doing s, they will be able to maintain a sys- n of rates drawn up in the interests of national economy.

The complete replacement of railway es by road services is generally only sible to a very limited extent. As re- ds secondary railways, for which this question is particularly important, Messrs. LA VALLE and MELLINI have made the following recommendations :

In the case of secondary railways of a local character, whose operation shows a deficit of an endemic nature, it is desirable that in each State the public authorities investigate their importance and utility, having regard to the requirements of the district served. When there are well founded reasons for keeping them in operation, State intervention to assist the transformation and modernisation of such railways is highly advisable. If the traffic requirements are not important and if modernisation of the railway entails heavy sacrifices, it is preferable to definitely abandon the line and create modern public road services.

It is more difficult in practice to solve the second question, namely how to guarantee the system of combined railway and motor public transport against competition from private traffic. Some protection will have to be given in the end, as the public methods of transport must be in a position to work regular and safe services and be so organised as to meet all requirements and charge given rates, the latter usually based on the national economic interests. The mere fact of requiring professionnal road transport undertakings to obtain a concession is no longer sufficient protection if the concession allows the firm to choose what traffic it will carry. In several countries concessions are only granted for a small radius, so that the railway can at any rate keep the long-distance traffic. To obtain the most effective road-rail co-ordination, the two methods of transport must be grouped together into a single monopoly. Attempts have been made to do this in Hungary, Rumania, Ireland and South Africa. The best example is the London Passenger Transport Board, as Mr. ASHTON DAVIES explains in his report.

Up to the present, private traffic has not, generally speaking, been restricted by law; the most that has been done in many countries is to forbid it to work professional transport. The future will show if it is possible to allow private traffic the freedom it now enjoys, or whether in order to safeguard the existence of public methods of transport and enable them to carry out their task in the interests of the community, it will not be necessary to limit this traffic also to some extent, either as regards distance, or by some sort of taxation.

When, for military reasons, it is necessary to take steps to have a sufficient number of lorries in the country, such measures must not tend to increase the total number of vehicles, but to assure a sufficient number of lorries suitable for military requirements. Furthermore, the possibilities of the railways' lorry services for this purpose must not be overlooked.

The railways have not merely waited for legislation to solve the road-rail problem; on the contrary, they have made considerable efforts to increase the utilisation of the railway. In most cases they have improved their commercial organisation, and taken great pains to inculcate a commercial spirit in their staff, in order to get closer contact with the public, and meet the public requirements to the greatest possible extent.

In this connection, the steps taken on the London, Midland and Scottish Railway are particularly interesting. Mr. Ashton Davies has the following point to make about this :

Convinced that commercial considerations were becoming of paramount importance, the L. M. & S. Company in 1932 decided upon a re-organisation designed to strengthen and improve contact with the public and to provide for the pursuit of a vigorous commercial policy through one officer responsible entirely and only for commercial issues.

Mention must also be made of the steps taken by this Company to extend its publicity through the medium of the staff. With this object in view, a competitive system, known as the « quotas » system, was introduced. You will find further details about this in Mr. ASHTON DAVIES' report.

The railways have not only improved their publicity methods, but they have made as many improvements as possible in their operating. In the case of the passenger services, the stock has been made more comfortable, the trains speeded up, and the number of services increased, all of which measures have proved effective against road competition.

Opinions are divided on the subject of light rail units : these have already been introduced in some countries, whereas in others trials with various types are still being carried out. Their success or failure depends in fact on local conditions to a very great extent.

Messrs. LA VALLE and MELLINI recommend, especially in the case of secondary railways, increasing the number of services by introducing light fast trains giving the maximum of comfort. In the case of express services by means of railcars (electric, or internal-combustion-engined), they think it preferable, in general, to have only one class.

In the case of goods traffic, the transport must likewise be speeded up as much as possible, and the door-to-door services extended. As regards collaboration between rail and road transport, the essential has already been said. Many railways have had to pay important subsidies to set up viable cartage services.

Protective measures of a rating kind

many and various; it may be said this connection that special reductions , taken as a whole, more effective than eneral lowering of the rates.

Gentlemen, I now come to the sumaries, which you will find on pages 100 d 101 of the English text of the sepae edition of the *Special Reports :*

. After the world economic crisis had ached its culminating point in 1932-33, dencies towards a revival of business vealed themselves in a growing number countries. Under their stimulus, railway ffic also increased somewhat, although to smaller extent than the development of dustrial production. The exchange of rchandise between States is hampered by port restrictions, clearing systems, curncy restrictions and monetary instability, th the result that the financial position of lways is slow in improving in most counes. In the interests of a return to a sound nomic position of the transport industry is desirable that these artificial barriers international trade be lowered, and as as possible, abolished.

. In all countries the number of motor hicles is increasing. The efficiency of d motor transport is constantly improving a result of technical progress and railys are subjected to ever keener competin from road motor vehicles.

. There is often the mistaken belief that the fight between rail and road, the hnical and economic efficiency of the thods of transport are the decisive factor. lways in most countries are bound by *to carry out public transport* according *principles safeguarding the public inests.* It is necessary that transport underings charged with essential public funcns be protected against competition from vate transport undertakings which are der no obligation towards the public, and free to select their traffic. With the aid appropriate measures, care should be en that long-distance traffic be mainly ndled by the railways, which should retain their mission of economic protection of the community.

4. By means of participation of the railways in road motor transport, endeavours should be made to bring about as complete a co-ordination as possible of the two methods of transport in public services.

5. The necessities of national defence should be met by creating a sufficient fleet of motor vehicles suitable for military purposes, whilst avoiding as far as possible any excessive and uneconomic increase in the means of transport as a whole.

6. In order to avoid unfair competition and obtain safer road traffic, the authorities concerned should enforce a stricter compliance with police regulations by road motor vehicles.

7. Railway publicity departments should seek as close a contact as possible with patrons. The greatest attention should be paid to a knowledge of the wishes and requirements of the latter.

8. Improvement of timetables and acceleration of trains on passenger services have proved to be efficacious means of meeting competition. On goods services, equally, the maximum acceleration is advisable, as also the extension of door-to-door services.

9. The framing of a regular system of tariffs should be considered as an important object of any transport organisation fulfilling the requirements of the national economy. For this purpose, the successive and reciprocal lowering of rates should be forbidden when brought about by competition between various methods of transport.

The application of this measure is difficult in the case of road transport. Railways in most countries are still obliged at present to have recourse to tariff measures as a means of protection. Isolated rate reductions to meet given cases have usually given better results than a general lowering of tariffs. It is advisable to subordinate the granting of reduced rates to a fidelity clause.

Gentlemen, I would like to make it clear that these findings and summaries

do not involve any of the other Reporters; they are my own personal remarks and summaries.

The President (in French). — Dr. Cottier has summarised the effects of the world crisis and road competition on the railways.

I do not think it necessary to translate this resumé; this will save time for the discussions. The German and English versions of the summaries are available and consequently everyone has the text before him. We can therefore go straight on to the discussions. (*Agreed.*)

Before we do so, however, I would like the Reporters who contributed to the investigation of this question, to say if they want to add anything ?

— As no one wants a translation of all Mr. Cottier's résumé, I will call upon Mr. Mellini to begin the discussions.

Mr. Mellini, *Reporter* (in French). — Mr. President, Gentlemen, I have followed Dr. Cottier's résumé with great interest, and for the most part I am in entire agreement with everything he said. However, I want to make a remark of a general nature, about the following matter : generally the Special Reporter bases his summaries on those formulated by the other Reporters, whereas in the present case Dr. Cottier has told us that the summaries he has drawn up as Special Reporter are his own personal summaries, i. e. do not affect the other Reporters. This seems to be something quite new. I do not know if the President will start discussions on these summaries, which in theory do not take into account those of the other Reporters. If this is the case, I am ready to examine all Dr. Cottier's summaries. I am not saying this in order to disagree with them, because I am ready to assent to nearly all of them myself, but would it not be best to read the summaries formulated by the other Reporters as well

The President (in French). — I agree with Mr. Mellini that the special report should really sum up the summaries of all the Reporters. But as Dr. Cottier has stated that the summaries he has drawn up express his own personal opinion, I think the only thing we can do is to ask the other Reporters to complete Dr. Cottier's summaries. When we come to discuss the summaries in debating Question X, we will have to add what the other reporters consider is lacking in the text suggested.

Dr. Cottier, do you agree that your summaries should be discussed and completed by the other Reporter's summaries ?

Dr. Cottier (in French). — I agree. I said that my summaries were rather personal, because I did not wish to commit the other Reporters to them. I was not able to discuss these summaries with them before today's meeting. I was only able to discuss them with Dr. Trierenberg, who agreed with them.

In the separate edition of the special reports distributed to the Meeting, I was not able to give certain summaries because I got the other reports too late. I must offer my excuses for this. I tried to mention in my verbal résumé some of the other Reporters' summaries.

The President (in French). — As this has cleared up the point raised by Mr. Mellini, I think we can now go on to the general discussions. Before we deal with the actual summaries, we must discuss Question X in general. The remarks put forward may perhaps guide us, and give us something on which to base the examination of the summaries.

I will therefore begin the general dis-
ssions on the question of the world
sis and road competition. Does any-
e wish to say anything ?

Mr. Jourdain, *Chemins de fer secon-
ires du Nord-Est, France* (in French).
I want to make some remarks about
e report presented, and give some fur-
er details about the co-ordination of
nsport in France. The reports avail-
le mention the law passed in 1934, and
e decrees published in 1935, to co-ordi-
te rail and road transport. Since then,
wever — the Reporters obviously could
t mention them — there have been the
nisterial circulars of the 12th August
36, 23rd November 1936, and a letter
om the Minister to the Co-ordination
mmittee, dated 1st March, 1937, which
ow that the attempts made to obtain
-ordination by agreements between rail
d road undertakings have on the whole
en a failure, that these agreements led
excessive compensation being paid to
e road firms, to the detriment of the
ers, by closing railway lines in order
enable them to recover traffic which
the other hand they were asked to
e up. Generally speaking, the public
ncerned have protested against trans-
rt schemes of this kind, so that to-day
e Minister is asking the Co-ordination
mmittee to make a further investiga-
n into the question, and it is thought
at in the end a system of authorisations
cences) will be necessary; he states
t it cannot be admitted that the com-
itive services they have established
ngside the railway give road carriers
ond on public services. Consequently,
e situation that existed when the Re-
ters drew up their reports must be
dified by these new ministerial orders.
vanted to call the attention of the Con-
ss to this point.

The present tendency is towards other arrangements. I must add that the French Council of State, in recent decrees, recognised that the Prefect in each Departement should have the right to license the remaining road firms competing against the railway, and it is for him to forbid vehicles to stop or stand in all places served by the railway when he considers this is in the interests of the railway.

These decrees, none of which have been in force for more than six months, show that the Minister is of the same opinion as the Council of State.

I have a few other remarks to make about the report, especially the question dealt with in Summary 3 of the special report. As these summaries will be revised by the three Reporters, I do not want to discuss them particularly, but I think nevertheless it would be a mistake to state, like Summary 3 does, that the importance of the question of the technical and economic efficiency of the methods of transport is exaggerated. I think that the value of such a comparison should not be lost sight of in the summaries.

At the moment, I am entrusted with the task of drawing up a report on the cost of different methods of transport, for the XXVth Congress of the International Union of Tramways, Light Railways and Public Road Motor Services, to be held in Vienna next month. The information I have collected shows that at the present time the cost of transport on secondary railways per tonne-kilometre is much lower than by road, and I suppose the comparison would work out even better in the case of main-line railways, if the figures were available. Now, our costs include the maintenance of the permanent way, which amounts to one fifth and sometimes even one quarter of the

expenditure, whereas the road firms contribute nothing to the maintenance of the roads except what they pay in fuel taxes.

When we work road services, we pay the same taxes as the road firms. Consequently, if the Special Reporter is justified in saying we should not stop at technical considerations alone, I think it is nonetheless necessary to alter this summary a little, so that it does not appear to imply that technically the efficiency of rail transport is really no greater than that of road transport. I believe that at the present time the railway is still the best method of transport, and I would not like to go too far from the summaries formulated at the previous Sessions at Madrid and Cairo, where these points were specially discussed. In the summary in question, the Reporter stresses long-distance transport, but those of us who represent the secondary lines do not want to see short-distance transport in bulk overlooked either.

I would like to go back to the summaries formulated at the Madrid Congress, when this question was particularly discussed.

These are the main points I wanted to raise before the new wording of the summaries is prepared. I should like these to be distributed as soon as possible, so that we will have plenty of time to consider them before tomorrow's meeting.

The President (in French). — If I have understood you aright, Mr. Jourdain, it is a question of the wording of the summaries. We will go back to this when discussing them. As for your first remark about State intervention, this adds to the information given in Dr. Cottier's report.

Mr. Jourdain (in French). — Exactly.

The President (in French). — Dr. Trierenberg will now address the Meeting.

Dr. Trierenberg, *Reporter* (in German). — The information imparted by Mr. Jourdain, about experience in France, is very interesting. This agrees with the point of view of the Deutsche Reichsbahn, inasmuch as the opinion of this Administration is also that State intervention is required in the economic evolution of the various groups which make up a modern State. However, the development of new forms of communication, such as that offered by the road motor vehicle, should not be opposed, as a matter of principle. One should endeavour to bring about organic co-ordination of the various methods of transport, in order to put a stop to their mutual competition. The difficulty in this matter lies in the fact that railways are used exclusively for public transport, whereas road motor transport is for the major part being developed on private initiative.

Legislation in the different countries should in no way impair the economic development. The transport policy of the Governments should aim at the safeguard and development of what is economically sound. In the case of goods traffic, an important point is the position, not only of the forwarding agent, but also that of the carrier. Both these kinds of undertakings are in private hands. Consideration should be given to the integration of the interests of the private undertakings in those of the community, and these private undertakings should, therefore, be allowed to develop on sound lines, which, in certain circumstances, is only made possible by freeing the individuals of risks. The community must, in certain cases, make some sacrifices on behalf of such private undertakings as

e necessary, from the economic point view.

Mr. Level, *Compagnie Générale de ies ferrées d'intérêt local, France* (in ench). — I am very glad that Mr. Mellini said the summaries drawn up by the fferent reporters should be taken into count. I hope these Gentlemen will eet this afternoon to consider the word- g of the summaries. I will take adntage of this opportunity for asking em to consider one particular case nich, in my opinion, is important, yet s only been touched upon in Mr. Cotrs's report. He said that many second- y lines, which have to be operated with e same rates and working conditions main lines with heavy traffic, are now heavy burden on the railways finanally. This is absolutely true, but, unss I am mistaken, no reference is made this very important point in the sumaries.

I want the Reporters to consider, dur- g their meeting, if they cannot give a summary about this to-morrow.

It should be pointed out that in many ses these lines have been handed over other organisations such as secondary ilway companies which, as you know, erate under much cheaper conditions an the main-line railways. This agrees ith Dr. Cottier's remark that the main- ne railways should be assisted in ghtening the burden consisting in opeting secondary lines in the same way main lines.

The President (in French). — Mr. Le l has just signified his approval of r. Mellini's remarks and he suggests at the reporters meet this afternoon to mplete the summaries and correct the nissions pointed out by Mr. Mellini d other Delegates. I think this is a good idea; however, I must remind you that the Meeting must not take more than one afternoon because we only have to-morrow in which to discuss Question X; the general discussion must therefore be finished today, and this small Committee given some guidance about the lines on which the summaries are to be drawn up. To-morrow we must be able to discuss the summaries one by one.

Gentlemen I want to know if you are agreed that a Special Committee should be formed, consisting of the Reporters under the presidency of Dr. Cottier, the Special Reporter, for drawing up the summaries. This Committee would complete Dr. Cottier's summaries by taking the other reporters' remarks into account.

Mr. Jourdain (in French). — Mr. President, I would like to add something to my previous remarks, to prevent any misunderstanding. Though the 1935 system was a failure in France, I would like to specify that it was possible to make agreements about passenger transport, but they had to be condemned on the ground that, generally speaking, they neglected the interests of the users, and it were the users who protested against them. On the other hand, one of the things we found particularly interesting in the German organisation was the system adopted for the transport of goods by road, especially the standard rates. I saw, in the report covering Germany, that this question of standard rates came up against many difficulties, and I think it would be interesting to hear some further details about this.

The President (in French). — Gentlemen, we must now decide who is to be on the Committee to revise the summaries. This Committee must be appointed as soon as possible, so that its

members can spend the afternoon at work and submit the summaries to you to-morrow.

Mr. Mellini (in French). — Is the general discussion finished? I do not think anyone else wants to say anything. In any case, the general discussion must be ended before the Special Committee meets, so that all the remarks made can be taken into account, and the text drawn up accordingly. I have already said, and I repeat again, that personally I am very nearly in agreement with Dr. Cottier's summaries. In most cases, I am quite prepared to assent to the Special Reporter's summaries.

As regards the composition of the Special Committee, it would be better to include as well those Delegates who have studied the question. Naturally everyone is interested in this question, but some of us have studied it very thoroughly. It would be better to finish the general discussions this morning and then select the Special Committee, which would include not only the Reporters but some of the Delegates here present who are particularly well informed about this subject.

The President (in French). — Mr. Mellini's remarks are very apt. To complete the summaries, it will be necessary to select a small Committee to revise the text. The Special Reporter's summaries will be completed, and once the text has been drawn up, our work to-morrow will be greatly facilitated.

It is also very proper that the general discussions should be completed before we do this, so that the Special Committee may have some guidance for its work.

Dr. Cottier might preside over the Committee in question, and choose the delegates to sit on it, subject to the assent of the Meeting.

Dr. Cottier (in French). — I agree.

The President (in French). — We will continue the general discussion.

Mr. Jarrigion, *Ministry of Public Works, France* (in French). — I notice certain statements, in Dr. Cottier's summaries, which I think require amplification. The railways have certain obligations and duties for the public good, particularly as regards transport on behalf of the State, reduced fares for the transport of large families, or certain persons. The same obligations do not apply to public and private motor transport. Consequently, it seems to me this creates unfair competition to the railway. On the other hand, from the social point of view, the railway staff is fairly large and is generally organised in Unions, so that it benefits from certain social laws which do not always apply to road transport workers. To be brief, I am just wondering if the Special Reporter's summary No. 6 might not be completed by the following words :

« With the object of avoiding unfair competition and securing greater traffic safety on the road, the appropriate authorities should enforce more strictly the police regulations on transport and *apply to road transport the laws and burdens in connection with staff welfare, imposed on the railways* ».

Mr. de Sousa, *State Railways in the Portuguese Colonies* (in French). — Gentlemen, I want to say just two words to stress the importance of a principle explicitely mentioned in Dr. Cottier's remarkable report. The railway is not a self-sufficient industrial undertaking the value and utility of which are to be judged by the receipts shown on the balance sheet. Unfortunately some people

- even some of us — condemn the rail-ay as soon as the receipts fail to cover ie expenses and affirm that new lines ıould not be built if they are not going) be profitable, no matter how useful ıey might prove.

The railway, however, is a necessary art of the national life; it renders enor-ıous administrative, economic and mili-ıry services, and it is entitled to the olicitude and assistance of the State hen it cannot meet its financial charges, r has to show a deficit. Full account ıust be taken of the services it gives its lients, and its part in the life of the ountry.

It is required to improve its stock and ervices, without taking into account the uin to which it is condemned if left to ear its own deficits.

I would like the Congress to make an uthoritative statement about the prin-iples affirmed in Summary No. 3 of the pecial report.

Dr. Cottier (in French). — I was very nterested to learn from the French elegates that the attempts made in rance to obtain co-ordination by means f agreements between the railway and oad firms have been a failure. I remem-er that in Switzerland, in 1933, we also ntroduced a law based on agreements ith representatives of the motor firms, nd the Swiss people rejected this law ı 1935, but for somewhat different rea-ons. The opposition came from both ie parties of the Left who found the estrictions did not go far enough for the otor services, and the Right who found at they went too far. This led to the w being rejected.

I think Dr. Trierenberg's statement will rove of great importance in the future. e told us that care should be taken not put an artificial curb on the technical development of motor transport on behalf of the railway. The main object to be kept in view was to regulate transport in general according to the national interest. This was what we stated in Paragraph 3 of our summaries. In Germany, co-ordination has been sought after in joint rates, but here again it must be said that the method has failed. It failed because it is impossible to control it. If the professional carriers are required to charge certain rates, you will find that these rates are not observed; there are a thousand ways of getting out of them. This is the lesson taught by German experience.

Dr. Trierenberg told us that in his opinion the road motor vehicle must be incorporated into the public transport system. A solution must be found. Everyone agrees about this : the railways must not confine themselves to rail transport, but must become transport undertakings making use of both rail and road. The general conclusion is : we must organise the road services, and Dr. Trierenberg who is conversant with its working says that under 50 km. (31 miles) the State imposes no restrictions.

However, this system again will not work, because the traffic is not shared with the railway. In Germany it is found that the railway must be given a share in professional transport. This is a new point, and I think it is a very important one. It is exactly the same idea as the Swiss solution of 1935. Professional carriers engaged in the general transport system were guaranteed a certain income, but I must tell Dr. Trierenberg that our people did not understand this guarantee very well. There was some opposition. Public opinion was not sufficiently englightened. If we adopt the solution of having concession holders who work on the same lines as

the railway, who from the financial point of view form part of the railway as special affiliated companies, we shall have made considerable progress. It would be extremely interesting to discuss this matter if we had more time at our disposal.

As regards the conclusions, I must say it is very hard to sum up all these matters in a few summaries. The essential points must be selected. We cannot write a complete manual on transport economics, because all these questions are always important. We must try to stress the chief points which at the present time are of some use for the railways; we must consider what recommendations the Congress will make to the Governments. In my opinion this is the main object of the summaries.

The President (in French). — We must now select the Special Committee to draw up the summaries; I suggest the members should be : Dr. TRIERENBERG and Messrs ASHTON DAVIES and MELLINI as they were the Reporters, as well a Mr. JOURDAIN. This Committee coul meet to-morrow morning. *(Agreed.)*

Dr. Cottier (in French). — I agre but I still hope my colleagues and Mr Jourdain will write out their summarie this afternoon. This would considerabl shorten the discussions to-morrow. I Mr. Ashton Davies wants to make certai additions of his own, I would be muc obliged if he would give us a writte text.

The President (in French). — Mr. Co tier suggests that the Special Committe meets under his presidency, not this a ternoon, but at 8.30 to-morrow morning and in the meantime its Members shoul write down their suggestions. *(Agreed.)*

— The Meeting ended at 12.30 p. m.

Meeting held on June 3rd, 1937.

PRESIDENT : PROF. DR.-ING. A. WASIUTYNSKI.

— The Meeting started at 10.30 a. m.

The President (in French). — Gentlemen, at yesterday's meeting, we finished the general discussions on Question X : « Effects of the world crisis and road competition on the railway position. Corresponding changes in railway commercial policy ». At the end of the meeting, we appointed a Committee to prepare the revised text of the summaries to be put before us this morning, this revision being necessary in order to take into account the various remarks made by the other Reporters.

This Committee met at 8 o'clock th morning, but was unable to arrive at d finite summaries for the Meeting to di cuss. Under these circumstances, we ha decided that today the provisional te of the summaries will be read out. Th text will serve as a guide for the Com mittee which will then prepare summ ries to be discussed in detail by the Se tion.

Dr. Cottier will begin by reading yo the French text. The English and Ge man translations will then be read. Th delegates present will be able to expre their opinions and tell us if this wor

ng agrees with their ideas. If need be, heir remarks will be taken into account y the Committee in preparing the final ext after today's meeting.

Dr. Cottier, *Special Reporter* (in French). — Mr. President, Gentlemen, as he President has just told you, the Reporters on Question X met this morning is a Special Committe to draw up the ext of the summaries. The Committee lso included the following : Mr. LE BESNERAIS, General Manager of the French Nord Railway, Mr. JOURDAIN, or the Nord-Est Secondary Railways (France), and Messrs. WATIER and METTERNICH, of the Permanent Committee on Railway Transport of the League of Nations.

We did our best to combine and condense the different opinions expressed.

I must call your attention to the fact hat there are three different texts. In principle, we are agreed. The representatives of the British Companies, including Mr. ASHTON DAVIES, who put forward a special text, may state they are in agreement in principle with my text as a basis for the discussions on the final summaries.

I am sorry I cannot supply you with typewritten copies of the text; there was not time. On the other hand, the subject is so vast, and so complicated, that it is difficult to combine all the different opinions in such a short time. We have done our best in spite of the very short time at our disposal.

To sum up, the Special Committee is agreed to accept my summary 1, as given on page 100 of the English text of the special report. This point has been agreed without change.

The Committee may also take into account certain wishes expressed by members of the 4th Section.

There is, however, a slight shade of difference, in the case of Summary 1, between the opinion of the English Reporter and that of the other Reporters. We said that « it would be desirable that these artificial barriers limiting international commerce should be lowered, and as far as possible, suppressed ». Mr. Ashton Davies would have been satisfied with the mere statement, without the final recommendation, but the majority of the Committee consider that the Congress should *recommend* that these artificial barriers to international commerce be lowered, and as far as possible, suppressed.

I do not know if this question will lead to any discussions.

The President (in French). — What Dr. Cottier has said seems to suggest that, after we have heard his preliminary remarks, we should discuss each point separately and the Meeting will remark on each point without a preliminary reading of all the summaries. If the Meeting agrees to this, we will now discuss the provisional text. The wording of Summary 1 remains as given in the special Report. Dr. Cottier has stated, however, that the English delegates think the last sentence unnecessary, viz. : —

> It is therefore desirable, in the interests of the financial equilibrium of transport undertakings, that artificial barriers limiting international commerce should be lowered, and as far as possible, suppressed.

The English Delegates think the actual statement sufficient.

I want you to give your opinion about Summary 1, which, I think, is a simple statement of the actual economic position, and decide whether the final recommendation is to be retained.

Mr. Ashton Davies, *Reporter*. — I

should like to point out that, whilst international trade barriers necessarily tend to exercise a restricting effect upon transport — more so, perhaps, under continental conditions than in the case of Great Britain — and from that point of view their reduction or removal would be in the interests of railway transport, their existence is dictated by national considerations of the widest possible character. In my view, therefore, this is not a point upon which an opinion can fittingly be expressed by this Congress.

My feeling rather is that in putting forward recommendations we should concentrate upon the relationship between road and rail transport, which we are suggesting is the most important reason for the fact that the financial situation of the railways generally has not shown more progress than it has done. This is a matter in which we as a Congress are directly and vitally interested.

It is essential for the national security and well-being that the railways should be maintained in a state of efficiency, and it should be part of the duty of the State to see that that efficiency is not jeopardised by the growth of alternative forms of transport not subject to control and regulation in the same form as are the railways.

For this reason it is important that stress should be placed on those matters in which the State should be encouraged to move in the direction of equalising the conditions under which the service of transport is carried on. Otherwise the effect is to impair a national and essential public service, which in the long run must be contrary to the interests of industry and the community.

The President (in French). — Mr. Ashton Davies has given us a clear outline of the English point of view on the question of road competition and the policy the State should follow in this connection. As for the divergence of opinion on the subject of the recommendation given at the end of Summary 1, I think this is a question of detail and I suggest, Gentlemen, that you carefully consider point by point, the provisional text suggested by the Committee, and give us your opinion thereon, so that we can see if anything in the text does not meet the wishes of the Meeting. The detail cannot be discussed just now; this will have to be put off till later. It has been decided, moreover, that the Committee will meet again this afternoon and afterwards can continue its work until Tuesday, June 8th, when we shall meet again to examine the final summaries it will have been working upon in the meantime. At the moment we must be satisfied with expressing our opinions on the principles involved.

Mr. Jourdain (in French). — Mr. President, from what Mr. Ashton Davies has just said, it seems that certain views were exchanged at the meeting of the Committee, but he is not in entire agreement with certain points considered in the provisional wording prepared this morning. I am wondering if we are not wasting our time by starting a discussion on a text, the written version of which is not available. Since we have to meet again next Tuesday morning, I think it would be best to stop discussing the matter now; the work is completely in the air at the moment. I suggest that the Committee meet again this afternoon and gives us as soon as possible the wording which meets the views of Mr. Ashton Davies. We can only begin discussing the matter seriously when we have the actual text in front of us.

The President (in French). — Are ou against the proposal to hear what e Committee has done up to the pre- nt?

Mr. Jourdain (in French). — The ommittee did not agree about a com- ete text. At least, I dont think so. Con- quently we are discussing something ry much in the air.

We are dealing with a question of ca- tal importance for the railways; in fact think it is the most important question this Congress. It must not be discuss- rashly. I would like the reporters to ree about the text, and when we have is text before us we can usefully dis- ss it.

The President (in French). — I gather at Mr. Jourdain thinks the discussion ould be interrupted.

Mr. Lamarque, *French Nord Railway* n French). — May I be excused for tervening. Mr. Jourdain was present the Committee meeting. But we, who e not on this Committee, would very uch like to know what was discussed. understood that we were going to listen the provisional summaries drawn up the Committee so that we could judge ether their general outline agreed with e views of the Meeting. I think the scussions would be furthered if these mmaries were read out to us.

We would very much like to continue e examination of this question this rning.

Mr. Jourdain (in French). — I would e to hear Mr. Ashton Davies's views.

Dr. Cottier (in French). — I am much the same opinion as Mr. Ashton Davies. I will inform you about the results reached up to the present, as very important amendments were suggested by Mr. Watier. I will read them to you. It will be just as well for you to know these suggestions, and afterwards the printed text will be distributed. The members of the 4th Section will then be able to discuss the matter properly on the basis of the printed text.

Mr. Ashton Davies. — I suggest that we postpone until to-morrow morning the discussion on my proposed wording, which has nothing in common with that put forward previously.

The President (in French). — It is not possible to postpone our discussions until to-morrow. Another Section is holding its meeting here to-morrow; we will have to continue the discussions next Tuesday.

Mr. Ashton Davies. — At the request of the President, this discussion gave rise to the setting up of a Sub-Committee which went thoroughly into the question. I think it is hardly proper to sum up this discussion in a few words, seeing that we are not in possession of the summaries arrived at by the Sub-Committee. In view of the importance of the subject, I think we ought to have before us a written text before proceeding at all with the discussion.

The President (in French). — Two suggestions have been made : some of the Delegates think there is no point in hearing the summaries read out by Mr. Cottier; others on the contrary think the suggested text should be put before the Meeting.

Dr. Cottier, our Special Reporter, is of the opinion that it would be advisable

to hear the text prepared by the Committee. Mr. Ashton Davies considers this quite superfluous. Mr. Jourdain thinks the Meeting should be adjourned until the written text is available. I must remind you that we can meet again next Tuesday. If we put off the discussions until next Tuesday, the Sub-Committee would have time to work on its text. The text could be translated into the two other languages and a sufficient number of copies printed; it would even be possible to print it in the *Daily Journal of the Session.*

I will again ask the Meeting whether it wishes to continue this meeting and hear the provisional text of the summaries drawn up this morning, or whether the discussions should be postponed until next Tuesday.

Will those Delegates who are in favour of the discussions being continued please put up their hands.

(About twenty Delegates were in favour of the discussions being continued.)

Will those who wish the discussions to be adjourned until next Tuesday please put up their hands.

. . . . . .

We see that the majority of the Meeting is in favour of adjourning the discussions.

Mr. de Sousa (in French). — Mr. President, I quite agree that the discussions should be adjourned until next Tuesday, but I also think that it would be a good plan not to discuss the provisional summaries, but to hear what they are. In this way we should have some idea of the solutions suggested and this would give us some information about the work done.

Dr. Cottier (in French). — The Meeting has voted against hearing explana tions of the work done up to the presen

I am sorry I will not be able to atten next Tuesday's meeting; this makes n difference, however, as I shall be prese at the Sub-Committee meetings to dra up the text. The Reporters will be abl to read the proposed text. The object c the proposal I made just now was simpl to give you a brief idea of the work don

The President (in French). — Here i a new reason for hearing the provisiona text of the summaries. Mr. Cottier ha just told us that he has to leave ne Saturday. He will not be present ne Tuesday when we continue our discu sions. It is therefore necessary to g back to the subject on which we hav just voted.

It is a question of hearing the propose summaries read, without any discussio I take it you all agree to this. *(Agreed)*

I would also like to have Dr. Cottier suggestion as to who is to act as his sub stitute as Special Reporter for Tuesday meeting.

Dr. Cottier (in French). — We ca settle this at the Sub-Committee meetin

Gentlemen we have settled Paragraph of the summaries. There is a slight di ference of opinion to be discussed by th Committee.

Summary 2. — Mr. Ashton Davies ha put forward a text which the Committe has unanimously decided to insert i summary 2. This is worded as follows

The competition of road transport, how ever, continues in varying degree to exerci an adverse effect upon the railway positio and must be regarded as a permanent fact in the field of transport. The question as its rightful place in that field cannot y be said to have been answered with an degree of finality.

We now come to *Summary 3* : in this e we have found a wording conciliat- ; my proposal and that of Mr. Ashton vies. We have taken into account the planations given during yesterday's cussions. In principle, we are fully reed to stress this important point of *blic service*. We will delete the first ntence dealing with technical and eco- mic efficiency, and put this idea in the cond place.

The essential object of all regulation the rail and road question is to safe- ard the role of the railway in the inte- st of the public services. All the Re- rters agreed about this at the Commit- meeting.

In the second sentence will be added : The result is that the choice between il or road transport does no longer dep- d exclusively on technical and econo- c motives ».

There is no difference of opinion out Summary 3, which we all think capital importance. The actual text st has to be polished.

As regards *Summary 4*, a compromise tween Mr. Ashton Davies's idea and ne was adopted by the special Commit- . There was also a very important endment suggested by Mr. Watier, ose collaboration we much appreciat- . The Committee proposes to adopt his endment.

We are going to say : « Road transport ould be complementary to, rather than mpetitive with, rail transport; it ould therefore be encouraged to the tent... etc. »

We will then go on to Mr. Watier's endment : « It is desirable that the sest possible co-ordination be brought out between both methods of transport rking public services.

« Amongst the methods which may be considered to obtain such co-ordination, are in particular :

— participation of the railway in road transport;

— lightening of the various obligations imposed on the railway;

— as far as possible equal taxation on both methods of transport. »

In the case of *Summary 5* : we ended by agreeing to delete this paragraph, in spite of the fact that in many countries the requirements of national defence are, in our opinion, greatly exaggerated from the point of view of road transport. In any case, in Switzerland and Austria, and even in other countries, the issue of national defence is always raised to further the absolute liberty of road transport. I raised this point in my report, but it is better not to go into it. It is a matter of principle. I suppose the Meeting will agree with the Committee.

Summary 6 : this *will become Summary 5*, owing to the suppression of the preceding paragraph. Here we have the suggestions put forward at yesterday's meeting of the 4th Section. We state that road transport undertakings should also be subject to certain social obligations. The same point was raised by Mr. Watier at the Committee meeting. The Committee is quite agreed that it should be taken into account.

The first part of the text as printed in the special report remains intact. Mr. Watier's amendment will then be added : « In order to avoid unfair competition and increase the safety on the road, the appropriate authorities should keep a stricter watch on the way the motor services observe the police traffic regulations *and the regulations about the work of drivers and other employees of road transport undertakings, the regulation of*

working conditions for the staff ensuring that their conditions are comparable with those of the railway staff.

« *It is also desirable to regulate motor transport in such a way that responsibility both as regards the transport properly speaking and accidents to third parties be made as effective as those imposed on the railway in similar cases.*

In the case of *Summary 7 (new Summary 6)*, an addition has been suggested by Mr. Le Besnerais :

« The railway's publicity services should endeavour to obtain as close a contact as possible with its customers. Very careful attention should be given to finding out their requirements and wishes. In particular attention should be called to *the greater safety of transport offered by the railway* ».

Point 8 (new Summary 7) : Mr. Watier suggests a slight alteration to the wording of the first sentence : « *Improving the timetables, particularly from the point of view of the frequency and speeding up of the passenger trains, and improving the passengers' comfort, are effective ways* of meeting competition. The goods service should likewise be speeded up as much as possible, and door-to-door services extended. »

No basic amendments have been suggested in the case of *Summary 9 (new 8)*, except a small addition at the end of the text in the first paragraph, suggested by Mr. Le Besnerais.

Nor are there any alterations to the second paragraph.

Finally a *new Summary 9* has been suggested by Mr. Watier :

« In view of the importance of the investigations now being made by the Consultative and Technical Commission on Communications and Transit of the League of Nations, into the co-ordination of the different methods of transport and more particularly of rail and road the Congress recommends that this work be carried to a useful conclusion as soon as may be; in view of the interest of this investigation to all the railways of the world, it is ready to facilitate the work of the Consultative and Technical Commission by placing at its disposal all the sources of information it possesses. »

The President (in French). — I have another observation to make about our work. The text that has just been read will be discussed again, when it has been polished and distributed. Perhaps the Committee could meet again to-morrow morning and prepare the final text, so that it could be printed in Saturday's *Daily Journal of the Session*.

Mr. Level (in French). — Gentlemen, I would like to remind those who were present at the Cairo Congress, of an extremely noteworthy observation made by Dr. Dorpmüller, the chief delegate for Germany, about motor competition. In substance what he said was : You can try very hard, but I predict that you will accomplish nothing so long as you do not consider the concessions system.

I must admit that Dr. Dorpmüller was a true prophet, and everything that has been done up to this time has remained a dead letter.

I am wondering if it would not be a good plan to take into account what Dr. Dorpmüller suggested four years ago, at Cairo, in the summaries that the Committee is going to examine and put before us next Tuesday, i. e. the system of concessions; this is the only way of saving the railways.

Dr. Cottier (in French). — My answer that since then Germany has also ound that the system of concessions by self leads to nothing. The same thing as found in England. It might be said at the system of concessions alone is tal for the railways.

Gentlemen, in our summaries we can- ot go into all these questions in detail. y personal opinion is as follows : it ill be more and more necessary in order safeguard this idea of the public in- rest of the railway to incorporate both ilway and motor transport in the ge- eral transport system. This was what I id in my report yesterday; this is the ject in view. Also in Germany the opi- on is held that the system now in force not sufficient. As long as the profes- onal carriers are free and work side by de with the railway, nothing will be hieved, in spite of the rating agree- ents, which are not respected.

The different methods of transport ust be grouped into one and the same ndertaking : if it is not considered de- rable to work road transport with stock vned by the railway itself, and the rail- ay staff, it must be done by an affiliat- l company or by agreement. But in any se the financial grouping is essential. ne English Companies have, in fact, hieved this. In England there are very tensive transport services; I had the portunity of seeing this for myself two ars ago. In my opinion this is the mo- l State railways should copy.

Consequently a revision must be made. ne State-controlled railways must be gi- n the right to work road transport. nis is the bridge that must be made for nsport in the national defence.

Gentlemen, I particularly wanted to ke this last point; it is the conclusion which I have finally arrived.

I am altogether of the same opinion as Dr. Trierenberg; there must be some sort of grouping of transport.

We did not mention this in the summaries for certain reasons.

In any case, we think that if the operating conditions are not to come altogether under State control, financial grouping is necessary. Mr. Mellini is of the same opinion.

Mr. Mellini (in French). — Yes, as far as grouping is concerned.

Dr. Cottier (in French). — In France there was such grouping until recently...

The President (in French). — I am afraid I must interrupt you.

Dr. Cottier (in French). — Mr. President, as the statement made by Dr. Dorpmüller at Cairo has been recalled, I feel impelled to say that a certain amount of progress has been made since then.

Mr. Level (in French). — In my opinion no progress has been made for four years; there is just as much competition as ever, in spite of all the attempts made. No agreement has been reached. Consequently I think I was justified in my reference to what was said at Cairo.

The President (in French). — I was present at the Cairo Session and I heard Dr. Dorpmüller's remarks; if I remember rightly he suggested State control of road transport.

Mr. Mellini (in French). — It was not a question of nationalisation but of grouping all the transport services in the hands of the railways.

The President (in French). — Gentlemen, we have heard what the Committee has done. We have seen that no ra-

dical changes have been made in the text of the summaries. It is merely a question of the final wording. Dr. Cottier has promised that the Committee, which will continue its work to-morrow, will publish the final text in Saturday's *Daily Journal*. Consequently we will be able to discuss this text next Tuesday morning.

Dr. Cottier is obliged to leave us; it is very regrettable. It cannot be helped, however, and we must make the best of it and ask the Committee to select a substitute. The choice of the Committee must be ratified by the Permanent Commission of the Congress.

I must ask the Members of the Special Committee to wait a few minutes afte this meeting, in order to make the nc mination to be ratified by the Permaner Commission.

I am sorry Dr. Cottier cannot be pre sent at Tuesday's meeting, when the fin text of the summaries will be discusse However, since it cannot be helped, I ca do nothing but express, and I am sur the whole meeting will join with me, ou deep gratitude to Dr. Cottier for his va uable work. I declare the meeting at a end.

— The rest of the discussions was a journed until Tuesday, June 8th.

Meeting of June 8th, 1937.

PRESIDENT : PROF. DR.-ING. A. WASIUTINSKI.

— The Meeting began at 9.45 a. m.

The President (in French). — Gentlemen, may I remind you that at our previous meeting, last Thursday, we finished the general discussion on Question X.

All we have to do now is to discuss the summaries drawn up by the Committee we selected. This Committee, with Dr. Cottier, the Special Reporter, as President, has completed its work and Dr. Cottier, in a note he sent me, has expressed his satisfaction at the fact that he and his colleagues were able to arrive at unanimous conclusions.

Consequently, Gentlemen, our work today will be to discuss the summaries unanimously agreed by the members of the Committee.

Dr. Cottier was obliged to leave us last Saturday.

At the end of our last meeting, we had therefore to propose, to the Permaner Commission, a Special Reporter to tal Dr. Cottier's place. The Committee wan ed Mr. Mellini — another reporter the question — to replace Dr. Cottier. handed in this proposal to Mr. Ghilai the General Secretary, who in the nam of the Permanent Commission, raised r objection to this choice.

Consequently Mr. Mellini will first all make a general statement in the pla of Dr. Cottier.

Mr. Mellini, *Special Reporter* (i French). — Mr. President, Gentlemen, think it would be as well to give a bri résumé of the work done since the fir meeting at which it was agreed that was necessary to revise the summari for Question X, and have these speciall investigated by a Special Committee.

Dr. Cottier, the Special Reporter, ha accomplished a very remarkable task; n

ally everyone has readily admitted
s. But when he had finished his re-
t, Dr. Cottier informed us that he did
have time to meet the other Repor-
s, and consequently his summaries re-
ted his own views. Under these cir-
nstances, the majority of the Section
e of the opinion that it would be
ter if a Committee — including the
er Reporters — examined these sum-
ries and revised them. The Special
nmittee also included other Delegates
m the Section. The problem to be dis-
sed related to both main-line and
t railways, and as there were certain
ferences in the summaries and in the
dencies observed on the different rail-
s, it was considered advisable to in-
de, in the Committee, representatives
oth main-line and light railways.
t was also considered advisable that
egates from the Consultative and
hnical Commission on Communica-
ns and Transit of the League of Na-
ns should take part in these meetings.
he Committee met under the presi-
cy of Dr. Cottier. The problems in
stion were considered in great detail
we drew up summaries very similar
those of Dr. Cottier. His summaries
the basis on which the new summa-
s have been prepared. The text has
n somewhat amplified in order to
ke it more complete.
here were three fundamental ques-
ns to be considered, namely : the
ld crisis, road competition, and the
tacles to international commerce. The
ee Reporters and the Special Reporter
recognised that the crisis is over in
different countries. The information
ilable shows that, in 1935 and 1936,
most countries production figures —
ecially those for industrial production
exceeded those for 1929, which is ta-
as the normal level. We all agreed
therefore, that the crisis could be considered as overcome, and that it was not necessary to include any references to the world economic position in the summaries.

There remained the two other questions : the obstacles to international commerce, and road competition.

The question of obstacles to international commerce and railway transport is naturally at one and the same time a technical, commercial and political question. We came to the conclusion that it was not advisable to deal with the essentials of the question, as this obviously would be going too far for a railway congress, and we decided it was better to express a wish that all obstacles and all difficulties in the way of foreign trade should be suppressed, in order to enable international traffic carried by rail to follow the increase in industrial production.

This is the first of our summaries; the question is not raised in the following clauses.

This brings us to the most important question, that of road competition. The question of road competition, as stated in Summary 2, depends chiefly on the incessant growth of the competition and the increase in the number of vehicles in circulation. These vehicles are not only increasing in number but also in loading capacity. The tendency already is to have very heavy vehicles, with a very large loading capacity. There is a tendency, especially in some countries, to have road motor trains. What can we do about this? We cannot try to stop the development of the motor vehicle, because the whole world looks upon the motor vehicle as the invention of the century. But we must study how to set a limit to this competition, and prevent it from becoming too disorderly, and unfair for the rail-

ways. The Public Authorities should be made to regulate the field of action of the rail and road services.

A first important distinction we have made in the summaries is as follows : long-distance transport and bulk transport should, as a matter of principle, remain in the hands of the railway. In the case of transport over very short distances and genuine private transport, road transport can be considered and perhaps encouraged.

You all know that in recent years the development of transport has been very disorderly nearly everywhere. We have heard the delegates from France, Germany and other countries state that certain governmental regulations had not in practice the good results expected. We, therefore, have drawn up texts making suggestions to the Public Authorities about regulating the relations between the railways and road transport services. At this point there arises, perhaps for the first time at our Congresses, a matter of very great interest, namely the greater safety of railway transport as compared with road transport.

You know that the law — at least in most cases — does not set very exact limits to the working hours of road transport undertakings. In certain places, goods transport by road is in the hands of drivers who are encouraged to do as much work as possible, by means of premiums; they drive for 8, 9 and 10 hours on end and so become too tired to drive with proper care, and sometimes serious accidents happen, chiefly for reasons such as the nervous tension of the driver.

This state of affairs has been referred to in Summary 5 which says :

With the object of avoiding unfair competition, and to give to the patrons of road hauliers the necessary security (as also to other road users), the appropriate authorities should :

(*a*) keep under strict observation all road vehicles and see that the transport bye-laws are carried out, with the main object of securing greater safety on the road;

This is a new idea introduced here.

(*b*) insist on all public road carriers carrying out their responsibilities towards their clients, covering themselves against third-party risks in the same way the railways are obliged to do;

(*c*) enact conditions of service in respect of staff employed in the public transport of both passengers and goods, comparable with those in force on the railways.

We are not dealing with vehicles used in tourist services, which are driven by their owners, because this is a very difficult case to take into account.

Summaries 6, 7, 8 and 9 refer to the possibility of improving railway services, especially on light railways.

If it is stated that everything possible must be done so that competition is not unfair, and that the railway must find its proper field of action to assure its future existence, it becomes evident that the railway must not lag behind, but must follow the technical progress made, and from this point of view it must be appreciated by the public.

These are the points I considered it advisable to sum up in order to give you a clear idea of the basis on which we worked.

I think the President will ask you to discuss all these summaries point by point; my own object was merely to give you a very general idea of the motives which led us to draw up the summaries in question, because we consider that we have chosen a rather rigid basis for this

blem. We think that there are extre-y important reasons for the text as rded being made to answer completely claims now made about competition ween road and rail.

The President (in French). — Gent-en, do you want the German and glish translations of the Special Repor-s résumé to be read ? I must remind that time is valuable, and if every-has understood what Mr. Mellini , it will save a good deal of time. *reed.)*

We will therefore begin reading the mmaries point by point.

Mr. Jouaville, *Joint Management of the erian Railways* (in French). — I just nt to ask the 4th Section to consider a minute, quite objectively, the facts n going to put before it, which bear the statements made in the Special mmittee's summaries.

he co-ordination of railway and road nsport, which in Algeria is almost en-ly covered by the general regulations, been an accomplished fact, in the e of passenger services, since the ddle of 1936, and is nearly completed he case of goods services.

o begin with, as far as passenger ser-es are concerned, I must make it clear in future every road carrier must e a licence, which explicitely defines field of action; his routes and time-les are fixed; and the road and rail-rates are drawn up on a standard is. I might add that it is easy to check rangements making their authors le to fines and penalties, because the nce for the vehicle, the route and etable card and the tariff card must produced on demand and shown to the road police and the special con-trol officials of the Co-ordination Committee.

It is also to be noted that the Government has now complete control of all the essential factors to obtain co-ordination of the two methods of transport; in particular, the rates can be restored to a healthy level upset by unreasonable competition, without any risk of the railway losing more traffic; it is also possible to make the organisation of passenger road services better than that required by the original operating decrees, and more worthy of their new status of public transport services.

To be brief, the chief characteristics of the co-ordination of Algerian passenger traffic is the way it has been carried out by gradual stages. I have told you about the first of these. The last is perhaps the enforcement of clause 12 of the decree of the 2nd August, 1935, according to which all services parallel to the railway must work on its behalf, i. e. are either operated by contract and according to specifications laying down a system of remunerations or dues, or else bought out at the right moment in the case of services which cannot be made to fit in with this formula.

In the case of goods traffic, likewise, the Algerian Committee has decided to work by stages, and prepare in this way for the complete realisation of the scheme. It is a complicated plan, undoubtedly, because the matter is a complex one, and the technical experts of the Home Committee might justly be proud of their work, if they had the time, or the idea crossed their mind!

They will willingly agree with me, however, that limitation of working areas, the prevention of duplicate services, and the formula for allocating the traffic, are indeed very far from being

realised in view of the capricious nature of transport on demand, so that it is too much to expect a complete reform at the first attempt.

The Algerian Committee had to prepare a transport plan, i. e. an allocation of the traffic according to an operating formula to be established. To lay a good foundation for the work, it has decided that the present distribution between rail and road shall provisionally hold good, and endeavours have been made to find means of stabilizing it, whilst submitting the undertakings to the discipline of co-ordination to begin with, and also to obtain the sound competitive rates from now on. To do this it was necessary to protect the railways properly against any risk of attack from the road carriers who wanted a one-sided increase of the rates.

A proposed agreement is now under consideration : the chief points are the withdrawal of stock over and above that required for dealing with the traffic worked, and the establishment of a proper equilibrium between the minimum road rates including the contributions and taxes, and the competitive railway rates, i. e. a certain category of exceptional rates including the terminal charges.

I must not conceal the fact that the attempts to make agreements about this proved particularly difficult, in view of the misunderstandings, and short-sightedness of some of the road carriers, the covert machinations of various outside elements, and the widespread spirit of distrust and haggling.

It seems however that approximately the necessary three quarters of the tonnage required for the plan to be approved has been covered, so that hopes can now be entertained.

When this happens — if we succeed — a decree is to be enforced, together with the orders authorising the operation, which will define the tonnage for each party; the decree in question was published at the end of last year and makes private transport pay contributions.

I may say that as soon as this is done, and you will all understand exactly what I mean, goods transport by road will be governed by co-ordination.

First of all, why have we obtained results?

I can see several reasons : because we were able to overcome the formidable difficulty of making agreements, which has been done in the case of about 95 % of the firms; because the Algerian railways were not able to bargain for compensations in kind and had to make the necessary purchases with the assistance of the Public Authorities, the capital sunk in this way being, however, speedily made good by the receipts recovered from the suppressed services; because they were not able to incorporate in the transport plan the ticklish question of replacement services, and the closing down of secondary lines, and had to be content at first with organising the road services and putting some 50 % of them into proper order. This reorganisation was made at the expense of the road carriers concerned, like that resulting from the technical possibilities of the routes, at the level permitted by the prohibition to run new services, because these services, whilst enjoying the advantage of retaining their receipts whereas their expenses were halved, should have been taken over automatically by the railway in the case of services parallel to the railway; because in fact all realisations of the plan depend not only on the value of the principle on which it is based, but essentially on the medium in which it has to be tried out; because the Algerian Committee

ving no Departmental organisation, s less at the mercy of local influences; cause it had the constant support of e Administration; and finally because ove all perhaps, in Algeria... « it was itten ».

And now, Gentlemen, I hope you will ow me to put before you briefly a few ggestions in the light of our expe-nce.

The problem of co-ordination, accord-g to the basic decree of 1934, as well logically, consists of two operations :

(1) The organisation of road trans-rt;

(2) Its co-ordination with rail trans-rt.

Each operation has three phases : an ganising plan, carrying it out, and ad-ring to it.

I will first of all deal with the organis-g plan. Is not every organisation an aptation of circumstances to suit a gi-n midst, according to a given idea, with given object? Under these conditions ght we not be justified in saying that, ugh throughout the world the intrin-elements of co-ordination should be ke, and include certain indispensable mbinations amongst the common ele-nts (rates and facilities offered to the blic), their adaptation will vary ac-ding to the object in view, according the midst concerned, and according to period in question, as the midst is endent on the period, like many other ngs.

n each country, in each group of ntries even, sometimes, the first thing refore is to ascertain the objects, the ure of the midst in which the trans-t develops, and adapt thereto the in-sic elements of co-ordination.

As regards the choice of system, there no doubt that the very best solution to improve the financial situation of the railways, when road transport is paying its way, is indeed to allow them to manage the road services as well. There is no doubt that this is what should be done when the traffic is not sufficient to give both methods of transport a livelihood. But the application is not quite so simple. This solution should be included in the positive social laws which, as we know, are based either on justice or expediency. So much so that there is a danger that any formula for rail-road co-ordination, whatever its intrinsic merits may be, will be made null and void by an unsuitable definition outside its proper object.

It is impossible to get over this difficulty, because the definition of law is the mutual delimitation of the actions of each, according to conceptions stated to be the best. This leads to the conclusion : as the transport law forms part of the political, social and economic framework of each country, it would not appear possible to give *a priori* a preference to any one system of co-ordination. From the financial point of view, the best system would be that approximating most closely to the formula by which road transport is integrated into the railway organisation, making it a single organisation for transport in common, able to use whichever method is technically the most suitable.

I believe it would be useless to try and select from the heap of contingencies any typical notion likely to give rise to immediate realisations.

Let us return to the French system, i.e. at present that instituted by the decrees of 1934-1935. This is the system of authorisations (licences) which means in actual practice concessions, since passing from the former to the latter system is merely a question of extending the pe-

riod of the licence, and reducing the number of licence-holders. In France the right to carry out public road transport has ceased to be a private right and has become a right of the community; only purely private transport remains more or less unaffected. The decree authorising services to be operated is a public enactment.

In France the elimination of a road carrier, according to the above-mentioned decrees, can only take place after paying compensation. This is the idea whose application is found in expropriation for the public good, after first paying a just compensation, but the two things must not be confused. Expropriation implies ownership, and the nature of the right of the road carrier is not a right of ownership pure and simple; the essential thing is that the amount of compensation depends on the nature and importance of the right taken over.

Logically, from this point of view, the French system is in itself an achievement, since it places the authorisation to transport and its conditions in the hands of the State and fixes the ways and means of eliminating carriers who should not fall within the transport plan.

Why then has this system not been realised everywhere? I do not wish to enter a field that lies outside my proper sphere; I simply want to record what our realisation has given us an inkling of, from this point of view, and this comes under my heading : « carrying out the plan ».

For the validity of the plan prepared by the Co-ordination Committee within the compass of the law, the decrees of 1934 and 1935 require the preliminary procedure to be an agreement to be come to between transporters, the interest of the users being subsequently safeguarded by having the plan examined on their be half by certain qualified representative (General Councils, Chambers of Com merce and Agriculture). Like all thos in France who were in any way connec ed with the endeavours made to obtai agreements, I am only too well aware o the difficulties met with when opposin private interests and general interest and when endeavouring to conciliat them, not to be prepared to vote in fa vour of all the means which will make i possible to avoid the unproductive quar rels of these two irreconciliable interest and avoid delays and failures.

When the decrees of 1934 and 193 were published, the political and socia feelings of the period had to be take into account, and undoubtedly the tim was not ripe. Since then, each day ha made it more and more imperative t stop the way in which the railways ar bleeding to death, and solutions simpl must be found. Now, there is one solu tion which is in no way outside the pu blic right, namely to give the member of the Committee such a standing as wi make it possible for the Public Authori ties to enforce immediately the agree ments made, without any further ado, o else act as arbitrators and settle the dis pute authoritatively.

The formation of the new French Com mittee is tending, I believe, towards thi This will do away with the painful job o trying to get agreements, during whic our experience is that the law itself wa more often discussed than the economy of the plan submitted, about which w were sometimes just asked for orders t conform with it.

As regards the procedure of approba tion, my opinion may be summed up a follows :

Whatever the co-ordination syste

dopted, it is necessary that after work-ng up plans giving every guarantee, their xecution can be decided upon apart rom all conventional agreements by an uthoritative decision on the part of the 'ublic Authority, acting as guardian and uide, and looking after the interests of ach and every party as long as is neces-ary.

Care must be taken to avoid controver-ies and disturbance to the services after he licences expire.

I now come to the observance of the lan.

From the moment we began our work, t every instant, the concern about the ifficulties met with to ensure adequate oad control weighed heavily upon the lgerian Committee, and was a great ob-tacle to our confidence in the future, ecause it seemed extraordinarily diffi-ult, in a country like ours, to change ver from unregulated liberty to ordered iberty. But entities are built up by re-etition, and since the transport plan was ut into force for passenger services, we re finding that the control is getting ore and more effective.

French law makes provision both for epressive and administrative control. he administrative control has been du-licated in the sense that the Commit-ee's mission is to assure the execution of he plan.

In Algeria this mission is particularly ifficult in view of the great number of ery small undertakings to be followed p step by step, especially at the beginn-ng; also because in the case of goods ser-ices, nearly all the transport comes un-er the « *on demand* » heading. It is the uty of the Committee to see that the greed plan does not remain a dead let-r.

This led me to foresee the necessity for aiding the Committee by studying the legal ways of facilitating and even enforcing a certain amalgamation of the firms working over the same routes.

For the same reason, I thought that if the mobility of transport on demand made it necessary, it should be possible, without any dispute as to the interpretation put upon the law, to extend the control of the application of the formula for the allocation of the traffic back to the very beginning, i. e. to the original allocation in favour of each of the parties concerned. Workable and suitable plans must be made to correspond with the control measures. By this I mean that, in preparing such plans, everything possible must be done at the beginning to make sure that, as it is imperative that the roads are duly able to deal with their share of the traffic and nothing more, the railway and road rates should be fixed on the same basis as far as possible, and the railway be in a position to give the public transport facilities comparable with those offered by the road.

Gentlemen, the Algerian Co-ordination Committee, in conjunction with the Administration of the Colony, has already gone very far in its experience of the French co-ordination system, and I have taken it upon myself to give you this summary of the essential points.

I have told you of my confidence in the achievements of this legislation, with certain reservations and within the financial conditions, as it contains the required means of working it out and carrying it out.

Its results will depend on the extent to which these measures are made obligatory and how quickly we decide how much we can afford to pay for it.

Gentlemen, I have endeavoured to keep within the bounds of the Congress and

my own role. If I have gone at all outside them, I hope you will excuse me. Perhaps you will consider it advisable to make some mention of what I have said, in the summaries.

The President (in French). — Mr. Jouaville, your remarks have been very interesting, but they should have been made at the proper time to the Reporter for your country. The Special Reporter would then have been able to take them into consideration for his report, and everyone would have learnt of them. I did not want to interrupt you just now, but you have certainly gone beyond the duties assigned to delegates at this Congress.

Mr. Jouaville (in French). — The time for the usual procedure for investigations had already expired when the information I have given you was collected. Nevertheless, I thought the Congress might like to make a record of it. This was the reason I intervened (1).

The President (in French). — It is in fact quite a special question which was not put before the Reporter for the French and Algerian Railways.

Consequently when we discuss the summaries in detail, I would like Mr. Jouaville to suggest whatever improvements or changes in the wording he thinks advisable.

Gentlemen, we will now begin to read the summaries suggested by the Committee :

Summary 1 is worded as follows :

1. Under the influence of trade recovery throughout the world, rail-borne traffics show a certain increase which, however, falls short of the general increase in production.

One of the primary causes why the financial situation of railways is slow in improving in most countries is the fact that exchange of goods between different countries is handicapped by import restrictions, systems of « clearing », control of currency, and monetary instability.

It is therefore desirable, in the interests of the financial equilibrium of transport undertakings, that artificial barriers limiting international commerce should be lowered, and as far as possible, suppressed.

Mr. de Sousa (in French). — I would like to congratulate the Committee on its work, and Mr. Mellini for his very clear résumé.

However, I would like to suggest a slight alteration in the wording : in the first paragraph I would like to add the word « generally » before « show ».

The President (in French). — Normally the traffic does not increase on all the railways. I do not suppose there will be any objection made to this addition.

— *Summary 1 was adopted with this addition.*

The President (in French). — Summary 2 is as follows :

2. But the most important cause of the delay shown in the improvement of the financial situation of railways lies in the continual development of road transport competition.

In fact, in every country, the number of motor vehicles and their loading capacity are increasing, at the same time as roads are being extended and improved. The consequence is that competition from road vehicles becomes more and more acute, and the harmful results of this are reflected in the general position of railways.

Although road transport must have a place

(1) Since the Congress, co-ordination of the Algerian goods services here reported as under consideration is an accomplished fact. *(Note by Mr. Jouaville.)*

the field of transport, the question of its htful place in that field cannot yet be d to have been answered with any degree finality.

I would like to suggest an amendment the second paragraph; in the French t I would like to replace « S'il n'est s discuté... » by « S'il est indiscuta... ».

Are there any other remarks about mmary 2 ?

Mr. Ashton Davies. — I wish to point t that there are some misprints in the glish translation.

The President (in French). — The glish version of the summaries will be de to correspond exactly with the ench text. This has not yet been done, d I shall be much obliged if Mr. Ash- Davies, in collaboration with the nslator, will alter the provisional glish text to make it agree with the ench original.

Mr. Metternich, *Permanent Commis- n on Railway Transport, of the League Nations* (in French). — Mr. President, m not sure if the alteration you sug- ted is agreed or if the old French text to be maintained. If your proposal is agreed, I would like to suggest an- er wording.

The President (in French). — As no ections have been made, the sugges- n has been adopted.

— *Summary 2 was adopted with the endment to the French text, suggested the President. The English text re- ined unaltered.*

We now come to *Summary 3 :*

Railways are under legal obligation to ure public transport in accordance with principles dictated by national economic interests. The consequence to Railways is that they have special responsibilities not incumbent on other methods of transport which, not being bound by the same obligations to public interests, are free to pick and choose their traffics, and fix their tariffs.

Under rational organization, road transport should be complementary to, rather than competitive with rail transport. It should, therefore, only be encouraged to the extent to which it is essential and affords a type of service not possible by rail. It is desirable in particular, that special care should be taken to conserve long-distance and heavy traffics to the Railways, whose economic status should, in the general interests, be preserved.

Has anyone any remarks to make ?

Mr. de Sousa (in French). — I do not quite like the suggested text. There is not only the « national economic interests », but also the great services the railways render to the country. Though the railway budget may show a deficit, it should not be condemned on this account. Sometimes even railways are built although it is known they will be worked at a loss.

In the first paragraph I suggest we replace the words : « ... principles dictated by national economic interests. » by « ... principles dictated by the complex exigencies of public interest, their economic efficiency not being the decisive factor in judging of their utility. »

The President (in French). — I think it would be better to say : « ... in accordance with principles dictated by general public interests. », which certainly takes Mr. de Sousa's suggestion into account, but is even more general in meaning as it also includes the interests of national defence, etc.

Does everyone agree?

(Agreed.)

Mr. Lamarque (in French). — Mr. President, I would like to say something about the same paragraph. I think it would be better to replace the words « ... principles dictated » — which sounds obligatory — by « rules inspired by the public interests » Mr. de Sousa to whom I have shown this wording, agrees with this.

The President (in French). — I think the expression « ... principles dictated » is the best; if the principles are imposed, this corresponds to the word « dictated ». I do not think it is too categorical, but it might be better to say « legally imposed ».

Mr. Lamarque (in French). — I think there is still a slight difference in the meaning. I think that the legislator has to be inspired by rules of public interests in order to be able to « impose ».

The President (in French). — Instead of « principles dictated » we might say « rules inspired ».

Dr. Trierenberg (in German). — The Committee took great pains to weigh the words used in this paragraph. The intention was in fact to make it clear that it was not a question of principles inspired by anything, but actually « dictated », and therefore obligatory.

The President (in French). — I see that three different suggestions have been made. Some delegates, among them Dr. Trierenberg, do not want any change made in the text; others wish to replace the words « principles dictated » by « rules inspired »; Mr. Ashton Davies suggests...

Mr. Ashton Davies. — I think we should retain the original wording.

The President (in French). — Wil those who wish to retain the origina wording please put up their hands ?

. . . . . .

I see that the majority are in favour o keeping the text unchanged.

— Summary 3 was adopted, the word « general public interests » being substi tuted for « national economic interests ».

The President (in French). — Thi brings us to Summary 4 :

4. It is desirable that the closest possibl co-ordination should be brought about be tween Railways and road motor vehicle offering a service to the public, notably b the following means :

by participation of Railways in road trans port, a participation which may, in certai cases, extend as far as concentration unde one management;

by an allocation of traffics between th two methods of transport, either by mutua agreement sanctioned by the Authorities, o by direct orders from the Authorities;

by substituting for competitive road service combined road-rail services such as con tainers, transport by rail of loaded lorries o trailers, etc.

In order that efforts to coordinate publi transport may not be nullified, it is also necessary that appropriate measures b taken to regulate private transport of good by road motor, particularly over long dis tances.

The application of these various measure presupposes the existence of sufficient moto traffic statistics, such as are already draw up in some countries.

I think it would be advisable to hea the three subsections with the letters *(a)* *(b)* and *(c)*.

Are there any remarks about this text?

Mr. Ashton Davies. — I propose to

say « requires » instead of « presuppo-ses » in the last paragraph.

Mr. Mellini (in French). — In some countries statistics are already kept, but in cases where statistics do not exist, they should be introduced.

The President (in French). — I think both expressions are good. Even if statistics are drawn up in some countries, both expressions meet the case.

Mr. Ashton Davies. — What, in my opinion gives importance to this paragraph is the necessity there is to have statistics. The fact that they exist in some countries does not imply that they are to be found everywhere. In my opinion, they should be drawn up in all countries.

Several Delegates (in French). — Instead of « presupposes », we should say « would require ».

The President (in French). — The majority of the Meeting propose that the expression « would require » be used instead of « presupposes ».

Several voices. — That's right.

A Delegate (in French). — In the paragraph : « by participation of Railways in road transport, which may, in certain cases, extend as far as concentration under one management », I should like to delete the words : « which may, in certain cases, extend as far as concentration under one management ».

The Special Reporter said that here it was a question of the relations between the railways and the Public Authorities, and care should be taken to keep the meaning very general.

I think this precision should be deleted. Is it necessary ? In my opinion, the very text says that it is possible to act otherwise. It depends, moreover, to a great extent on the position of the railways in the various countries; in certain countries the railways are State-owned, in other countries they are private companies. I think that if the first expression : « by participation of railways in road transport » was retained, it would be sufficient and the final amplification of the idea should be deleted.

Mr. Mellini (in French). — We studied the situation in the different countries at great length. If we say : « extend as far as », i. e. when there is no necessity, the first part of the summary is sufficient; but this concentration is required in certain countries, so that I think the whole text should be retained.

The President (in French). — We know that the Committee took great pains with the wording of the summaries. I do not think the meaning should be restricted. The statement made is based on the actual practice on the railways.

Mr. Jarrigion (in French). — In the third paragraph it is said : « by an allocation of the traffic between the two methods of transport, either by mutual arrangement sanctioned by the Public Authorities, or by direct order from the Authorities ». It has been proved to us, at the last meeting especially, that agreements have been found useless, and should not be sought after, since in the countries where such agreements have been made, it has been found necessary to look for some other method. In the other countries, the allocation of the traffic is made by the Public Authorities. Consequently, I consider it useless to in-

clude the phrase... « either by mutual arrangements sanctioned by the Public Authorities... » as it is contrary to the information we have received, especially in the case of the countries where it has been put into practice.

I suggest the following wording : « An allocation of the traffic between the two methods of transport, by the direct intervention of the Public Authorities. »

The President (in French). — You mean you do not approve of agreements ?

Mr. Jarrigion (in French). — I do not disapprove, but I do not think they are any use.

The President (in French). — This is contrary to the statements made. Some of the information received shows that agreements are possible, and that this is the best method. Certain countries have found it the best solution. I think it is impossible not to formulate this statement in this way.

Mr. Mellini (in French). — This question also was discussed at the Committee meetings. I might say that, personally, I have no reason for opposing the solution suggested, but I think that in all countries where the Government's authority ranks high, this text indeed applies. Why should we range ourselves against this authority ? It would be better to retain the text we proposed.

Mr. Jarrigion (in French). — I withdraw my objection.

The President (in French). — Summary 4 is therefore agreed with the amendement suggested in the last paragraph. *(Agreed.)*

We now come to *Summary 5 :*

5. With the object of avoiding unfair competition, and to give to the patrons of road hauliers the necessary security (as also to other road users), the appropriate authorities should :

(*a*) keep under strict observation all road vehicles and see that the transport bye-laws are carried out, through the intermediary of the police, with the main object of securing greater safety on the road;

(*b*) insist on all public road carriers carrying out their responsibilities towards their clients, covering themselves against third-party risks in the same way the railways are obliged to do;

(*c*) enact conditions of service in respect of staff employed in the public transport of both passengers and goods, comparable with those in force on the railways of the country.

Mr. Jouaville (in French). — Mr. President, I think co-ordination will have been achieved in many countries before the next session of the Congress, as it only meets every five years. Would it not be opportune to add, to these recommendations, the control of the co-ordination regulations ?

Do you not think it would be advisable to insert, at the end of paragraph *(a)*, the statement I have just handed in?

The President (in French). — It is suggested, Gentlemen, that at the end of paragraph *(a)*, the following phrase be added : « and seeing that the established co-ordination regulations are kept ».

Mr. Ashton Davies. — I propose that this member of the sentence be added as a separate paragraph.

Mr. Lamarque (in French). — If the idea is that the Public Authorities should see the regulations are kept, I think this sentence should be added to Summary 4.

r. Trierenberg (in German). — In opinion, Summary 4 deals in partic- with the organisation of co-ordin- n, whereas in the present case it is uestion of supervising it.

onsequently it would be better to in- le Mr. Jouaville's suggestion in Sum- y 5 than in Summary 4.

Ir. Jacquet, *Ministry of Public Works, nce* (in French). — We are trying lraw up recommendations asking the ernments to pass laws on co-ordina- . Isn't it rather a doubtful compli- it to suggest *a priori* that the Govern- nt will not trouble to see its own re- ations carried out ?

suggest we do not adopt the modific- n suggested. I think the addition uld be rejected.

he President (in French). — If this ition hurts your susceptibilities, para- phs *(a)*, *(b)* and *(c)* should be just listasteful, since they all state that the petent Authorities *should...* ».

r. Jacquet (in French). — I quite e that the Authorities should be ask- o do something, i. e. to bring about rdination. But I do not agree that nould be suggested straightaway that Governments will not take steps to rce the laws passed, which is what proposed addition amounts to. If the ernments « edict » something, it ns that they intend to « carry it into ct ».

ne President (in French). — I would to hear the opinion of the Special rter on this subject. Different opi- s have been expressed, either that the should be kept as drawn up by the mittee, or the addition made, or that this addition should be added to Summary 4 rather than to Summary 5.

Does Mr. Mellini consider that it would be compatible with the Committee's point of view to insert the words « and seeing that the established co-ordination regulations are kept »?

Mr. Mellini (in French). — Regarding this addition, I am of the opinion that it would be better to keep the text originally suggested, because I quite agree with Mr. Jacquet's final remarks. We are meeting here as an international Congress; should an international Congress suggest that laws will be passed and not enforced ? I think this is going a little too far. I think that when we state that the Public Authorities should pass laws, it is obviously understood that they must also take all possible steps to see that these laws are kept. If the Meeting insists on the addition, however, I will agree to it.

I am sorry I cannot agree with Mr. Lamarque. Summary 5 states : With the object of avoiding unfair competition... » and it is here that we should understand : « Everything possible will be done to prevent... »

Having said this, I repeat that in my opinion the summary under discussion should be left as it is. If it is decided to include the addition, however, it should be phrased as suggested by Mr. Ashton Davies.

The President (in French). — The Special Reporter consequently wishes the text to be left as drawn up by the Committee.

For my part I think that « ... the appropriate authorities *should* » is too categorical. I would prefer to say : « *It is desirable* that the appropriate authorities should : *(a) keep...* » This is a

more elegant phrasing than the word « should ».

I want to know whether the majority of the Meeting is for or against this addition, taking into account the Special Reporter's opinion that the text drawn up by the Committee should not be changed, that is to say by adding to paragraph *(a)* the text suggested by Mr. Jouaville. The word « should » however, would be replaced by the phrase «It is desirable that ».

Mr. Jouaville (in French). — If we owe it to the scruples of the Special Committee that this addition is to be left out so as not to offend the feelings of the Governments by implying that they will not see to it that the laws passed are kept, I think another part of the sentence about the police measures should be deleted. We must be logical.

Mr. Mellini (in French). — This relates to safeguarding human lives. We must take the safety of the traffic into account.

Mr. Jarrigion (in French). — Without prejudice to other remarks about certain paragraphs, the question now at issue is that of making an addition; perhaps other additions are also necessary, for example I would like to alter paragraph *(c)*.

The President (in French). — We have only got to paragraph *(a)*. I want the Meeting to express its opinion about the addition suggested in the case of paragraph *(a)* and the suggestion I made about changing the wording by replacing the word « should ».

Mr. Mellini (in French). — I do not quite agree about changing the wording. In summary 4 we said : « It is desirable... »; Summary 5 has already been made less imperative. It would weaken the meaning too much to say « It is desirable »... You will remember that the Committee expressed the opinion that the summaries should be made rather more imperative.

The President (in French). — Mr. Mellini thinks my little alteration is not altogether advisable because it weakens the meaning. If the Meeting agrees with this, I bow to its opinion.

Will those who want to keep the first paragraph as drawn up by the Committee please put up their hands ?

— *The majority was in favour of keeping the introduction and paragraph (a) as they were.*

This brings us to paragraph *(b)*. Are there any remarks ?

— *Paragraph (b) was adopted without any change.*

Then there is paragraph *(c)*. Has anyone anything to say about it?

Mr. Jarrigion (in French). — I hope I will be excused if I make a further remark on this subject, but I would like this text to be completed. It is not only as regards the service conditions that road transport has to carry a lighter burden than the railway. There are also the social obligations which are not enforced in the case of road transport, the question of pensions for example. I would like the text to be completed as follows :

(c) Enact conditions of service *and social legislation* which will assure that those employed in public passenger transport and all goods transport will benefit by the same working conditions and insurances as the railway staff. »

This is the only way of getting fair competition, because if this is not done

competition will still remain unfair, I think it is absolutely insufficient go no further than the service condi-as.

Ir. Ashton Davies. — I suggest that s paragraph be left as it stands.

The President (in French). — Mr. rigion wants to make additions to par-aph *(c)*, dealing with social legislation l insurance; Messrs. Trierenberg and nton Davies are against this suggestion.

Ir. Mellini (in French). — I also want text to be left as it stands. Here we all railway men, but on the other nd, these same problems will be invest-ted and vitality of motor transport ght after at road transport meetings. nat we have already asked for is ex-mely important in my opinion, and it uld be quite sufficient for the time ng to achieve this object, i. e. lay down nparable service conditions. But if we 't talking about insurances, perhaps are going too far and will end by ng told : « Yes, you want to kill road nsport. This is going too far ».

n principle, of course, I am all for the gestion, but in practice it is not desir-e. Let us not say : Social legislation st be enacted to put motor transport an inferior position. For these reasons, gree that the original text should be ained.

The President (in French). — I think s quite clears up the matter. The Spe- Reporter has given his reasons for ntaining that the wording should be as it is. I think no useful purpose uld be served by continuing the dis-sions on this point.

o you agree, Mr. Jarrigion?

Mr. Jarrigion (in French). — I would like to insist, because there is certainly some confusion in the wording as it stands. The expression : « ensure... working conditions » refers exclusively to working hours. According to the French meaning and the regular practice in railway terminology, « réglementation du travail » means both the working hours and the work done, and to my way of thinking, by adding « social legislation », other matters are taken into account, i. e. pensions which are available on the railway but not for road transport. In France this difficulty has been overcome or is on the point of being overcome, by making it obligatory for road carriers to let their employees share in the pension schemes of the railway. For this reason I would like to insist on my amendement.

The President (in French). — What you say has been noted, and I would like the Meeting to vote on the text proposed by the Committee, and decide whether the words « social legislation » and « insurance » are to be added.

Mr. Torres, *Benguela Railways* (in French). — At present, technical, juridical and psychological sciences, in their noblest and widest applications, have been called upon to assist railway operation, labouring under adverse circumstances. As a matter of fact, the Bureau of our Section includes two Professors.

I therefore beg leave, Gentlemen, to begin by paying homage to Dr. Wasiutynski, the renowned Polish professor, and to Dr. Fezas Vital, one of the most eminent professors of the Lisbon University. *(Applause.)* Coming back to the subject under discussion, I share Mr. Jarrigion's opinion. In order to make simpler and more uniform the operating

conditions of road and rail transport, I think it would be possible to obtain everybody's agreement by replacing Paragraphs *(a)*, *(b)* and *(c)* of Summary 5 by the following condensed text :

« Submit public road carriers, as regards safety, regular commercial operation and welfare of the staff, to conditions corresponding to those observed by the railways ».

However, I am quite willing to retain the wording proposed by the Special Reporter, out of respect and admiration for this work. In this case, I would simply wish to say « a staff code » instead of « conditions of service », and add the words « and social conditions » after conditions of service ». As regards Summary 7, I would add to the second paragraph, « easing of tariff conditions » between the words « transport » and « and »; in Summary 9, 2nd paragraph, I should like to introduce the word « prepared and » between « methods » and « designed ».

Dr. Trierenberg (in German). — I want to stress the fact that in the German translation of the text under discussion, the wording is very clear and includes all the points under discussion. Even if any changes are made in the French text, I would like the word « Arbeitsbedingungen » to be kept in the German text.

The President (in French). — If we add anything to the expression « réglementation du travail » we will upset the English and German translations. Consequently I think the wording suggested by the Committee meets all the opinions of the various countries the best. It is obviously impossible to get a text which will completely apply to every country without distinction.

Mr. Mellini (in French). — I insist that the text should be approved as it stands. If this is rejected and we have to accept the new wording suggested, I would like explicit mention to be made of public passenger transport.

The President (in French). — The Special Reporter particularly wants the Committee's original wording to be retained, but if this is impossible he wants the reference to be to public passenger transport only.

Mr. Ashton Davies. — I share Mr. Mellini's opinion, that the wording be retained as put forward by the Special Committee.

A Delegate (in French). — The English and German texts are quite satisfactory. The French does not exactly correspond to the German text. It would correspond if it was made to read : « Assurer au personnel affecté... des conditions de travail comparables à celles du personnel des chemins de fer ». The first words of the French version : « Edicter une réglementation du travail » would then be deleted.

The President (in French). — The words « édicter une réglementation du travail » would be crossed out in the French version.

Mr. Mellini (in French). — Such a change is possible.

The President (in French). — Does everyone agree that paragraph *(c)* be worded as follows :

« *(c)* Ensure in respect of staff employed in the public transport of both passengers and goods, working conditions comparable with those in force on the railways of the country. »

— *Approved.*

The President (in French). — We ow come to *Summary 6 :*

6. In order to suit all economic needs, it is nportant that all methods of public trans- ort adopt published tariffs, consistently pplied, and based as far as possible on the ame principles. If, in other respects, condi- ons of equality could be achieved between ail and road transport, the carrying out of uch a measure would avoid the unnecessary eduction of their existing rates by both arties.

Until such time as this question, the appli- ation of which would be difficult, has been olved, the railways of most countries are ill compelled to resort to the lowering f rates.

The reduction of rates in specific cases, ometimes granted only on condition that he firms concerned hand over the whole of heir transport to the railway, has been found o give better results than general rates eduction.

Has anyone anything to say ?

A Delegate (in French). — The rench, German and English texts do not uite agree. In the third paragraph of he French version it states : « En atten- ant cette réalisation, d'application dif- icile... » which, in French, means that t is impossible.

Several voices. — No.

The same Delegate (in French). — his text seems to me to go further than he German text which says : « overcome he difficulties. »

I think it would be better to suppress he words : « d'application difficile » in he French version, or make the meaning ore general.

The President (in French). — It is uggested that the words : « d'applica- on difficile » at the beginning of the ird paragraph be deleted.

Mr. Mellini (in French). — I am not altogether against doing this. Why did we use these words ? Because it was a difficult matter. This explanation is a very useful one, so that I want the wording left as it is.

The same Delegate (in French). — We might say : « Until such time as the difficulties inherent in the application are overcome »; this is a literal translation of the German text.

Mr. Mellini (in French). — I would like to point out that the French text is the official text.

The same Delegate (in French). — In my opinion it would be better to say : « Until such time as the difficulties inherent in the application of the measure have been solved by the railways in most countries... »

Mr. Mellini (in French). — No, this is not what we are saying, but « En attendant cette réalisation... » because certain Governments will be against this application. This is rather different. I repeat that I want the text left as it is.

The President (in French). — Perhaps we could say : « which might prove difficult » or else « the application of which may prove difficult ».

The same Delegate (in French). — We might say : « the application of which may meet with certain difficulties. »

Dr. Trierenberg (in German). — In my opinion the beginning of the third paragraph should be altered as follows : Wherever the application of the measure would present difficulties, the railways... »

Mr. Lamarque (in French). — Supposing we said : « Until such time as the difficulties that would be met with in the application... »

The President (in French). — We have two different opinions to consider. Certain Delegates are of the opinion that the wording suggested by the Committee is the best, whilst others want it to be altered and something else substituted for the words : « the application of which is difficult ». The sentence : « Until such time as the difficulties inherent in the application of this measure have been solved » has been suggested, for example.

Does the Special Reporter agree to this change ?

Mr. Mellini (in French). — It might be accepted.

The President (in French). — Is the Meeting in favour of this alteration ?

— *The majority are in favour of altering the beginning of the third paragraph as follows :*

« Until such time as the difficulties inherent in the application of this measure have been solved, the Railways of most countries are compelled to resort to the lowering of rates.

The reduction of rates... ».

The President (in French). — We now come to *Summary 7 :*

7. On those services were working is to be continued by the railway, the improvement of passenger facilities, by increasing the speed and frequency of trains, as well as improvements in their comfort, have proved to be efficacious means of meeting competition, and it is desirable to continue in this direction.

On the goods side, experience has shown that regularity in delivery times, acceleration of transport, and extension of door-to-door facilities, are excellent means of increasing traffic.

Summary 6 brought us to the end of the discussion about competition. With Summary 7 we come to the ways in which the railways can fight competition.

Are there any remarks about summary 7 ?

Mr. Matter, *Swiss Federal Railways* (in French). — The second paragraph deals with goods services. Obviously, as everyone will agree, door-to-door transport is one of the best ways of fighting motor competition. For this reason it deserves the closest attention. In Switzerland we have succeeded in introducing door-to-door transport over the whole of the Swiss Federal Railways; even the private Companies have introduced such services or are doing so. In addition to local door-to-door services, it has also been found possible to introduce such services over fairly long distances, that is to say, when necessary, cartage services have been organised in places where there are no railway services. In such cases in particular — the long-distance services — all the carriers have to charge the rates decided by the Administration which are published just like the railway rates. I think, therefore, that the wording of the second paragraph should be made a little more explicit, and it should be stated that the object should be to organise door-to-door services from all the stations without exception, and, if need be, also organise a cartage service to places not served by the railway.

The President (in French). — Taking into account the information given by Mr. Matter, I think the case would be met

we said : « ... are excellent means of creasing traffic and should be gener-ly adopted ». Mr. Matter, your point that the application should be general, nt it ?

Mr. Matter (in French). — Door-to-oor services must be organised at all e stations.

I will give you a text to vote on. Per-ps the Special Reporter would give his inion on my suggestion.

The President (in French). — A de-nite text must be available before this possible. Are there any other re-arks ?

Mr. Ashton Davies. — I understand at we are discussing such measures as nnot apply to all Railways.

I suggest that we adopt the summary oposed by the Sub-Committee, in order make the other Railways alive to the ct that door-to-door services are excel-nt means of increasing traffic, and so d these Railways to prove the useful-ss of such services on their own sys-ms.

Mr. Valcke, *Belgian National Light ilways Company* (in French). — I nt to insist that the wording be left it stands. As regards door-to-door ser-es, it must be pointed out that all ors are not accessible, and in this con-ction we must be content with general ms which can apply universally.

The President (in French). — I see at the prevailing opinion is that the ori-al text is the best.

I would like the Meeting to vote about eping the text as it stands.

— *The majority are in favour of keep-the text drawn up by the Committee.*

Mr. Le Besnerais (in French). — I think both parties might be satisfied if the text was left as it stands, but completed by the following addition : « and should be adopted wherever possible. » I think this would satisfy Mr. Matter. The addition orginally suggested was much more absolute than my suggestion, which will perhaps please everyone.

I may add that I put up my hand before the matter was put to the vote, but the President did not notice.

The President (in French). — Here is a new suggestion then. I did not notice that Mr. Le Besnerais wanted to speak before we voted. We will therefore have to vote again.

Mr. Le Besnerais suggests adding the words : « ... and should be adopted wherever possible ».

Does the Special Reporter agree to this ?

Mr. Mellini (in French). — I am not against it, I think the words « wherever possible » might do.

Mr. Ashton Davies. — Agreed.

The President (in French). — This means that the text would be :

« On the goods side, experience has shown that regularity in delivery times, acceleration of transport, and extension of door-to-door facilities, are excellent means of increasing traffic, *and should be adopted wherever possible.* »

I shall be obliged, therefore, Gentlemen, if you will once more vote on the text I have just read. *(Agreed.)*

The President (in French). — The new wording is therefore accepted.

This brings us to *Summary 8* :

8. The experience gained by the different

Railway Administrations has shown the benefits obtained from suitable advertising and general propaganda. It is most desirable that all forms of advertising and propaganda be developed, that canvassing for traffic be intensified, that closer contact with clients be obtained in order better to understand their wishes and needs, and keep them informed as to the various possibilities and advantages to be derived from the use of the railway.

— *Adopted without any remarks.*

We now come to *Summary 9 :*

9. Speaking more generally, Railways must continue to follow the commercial methods which have been proved sound in other spheres of business.

It is also particularly desirable that Railways introduce methods designed to encourage the interest of employees in the development of traffic and the economic position of the railway service.

Gentlemen, have you anything to say ?

Mr. Lamarque (in French). — Mr. President, I think the wording of the first paragraph fails to take into account all the consequences of the idea. It says that : « Speaking more generally, Railways must continue to follow the commercial methods... ».

It appears desirable to add the idea : « ... the Government Authorities should afford them all possible facilities, especially since the land transport monopoly they formerly enjoyed no longer exists ».

There are certain countries in which it may be desirable to obtain greater facilities from the Public Authorities for using commercial methods.

The President (in French). — Gentlemen, in connection with completing the first paragraph by adding to the original wording : « The Government Authorities should afford them all possible facilities, especially since the land transport monopoly they formerly enjoyed no longer exists », I would like to point out that this addition includes two different ideas : the first, that the Government Authorities should afford in this respect — in respect of operation by commercial methods — all possible facilities, and then the idea which is being stressed : « especially since the land transport monopoly they formerly enjoyed no longer exists ». What is the object of this addition ? Two different statements are made; one merely implies a desire that the public authorities should grant certain facilities, while the other states that the railways have lost in certain cases the monopoly they used in fact to enjoy, and this is why the first recommendation is particularly desirable in such a case.

I would like to know if anyone has any objections to this addition ?

Mr. Ashton Davies. — I propose to add « ... especially since they no longer enjoy a transport monopoly. »

The President (in French). — We have commented on the suggested addition to the first paragraph. I would like to know if the Special Reporter is in agreement.

Mr. Mellini (in French). — I am prepared to accept this proposal.

Mr. Le Besnerais (in French). — Would the President be good enough to read it through again.

The President (in French). — There are two proposals : one — that made by Mr. Lamarque — is as follows : « The Government Authorities should afford them all possible facilities, especially since the land transport monopoly they formerly enjoyed no longer exists ». The

ther suggestion is : « Speaking more enerally, Railways must continue to foll- w the commercial methods which have roved sound in other spheres of busi- ess, *especially* since they no longer en- oy a transport monopoly ». The last hrase was Mr. Ashton Davies' sugges- ion.

Mr. Valcke (in French). — It is so ague. I do not understand what the fa- ilities referred to are. In another sum- nary it is asked that road transport hould be obliged to apply the same ra- es, which seems to be contradictory.

Mr. Lamarque (in French). — The fa- ilities in question are of a regulative ind, to be granted in various countries, ecause the position is not the same verywhere. The object is to lighten the bligations when the regulations make it ard to introduce commercial methods f operating.

Mr. Allard, *Principal Secretary* (in rench). — Do you think there is much oint in adding this part of the sentence?

Mr. Lamarque (in French). — I think is useful.

The President (in French). — Mr. shton Davies does not want to express he idea that the Public Authorities hould make it easier to introduce com- nercial methods, but he thinks that it nould be stated that commercial me- nods are particularly necessary since the ailway has lost its monopoly.

Mr. Le Besnerais (in French). — think everyone could be given satisfac- on in the following way : Mr. Ashton avies' text would be adopted and follow- d by the sentence : « Wherever neces- ary, the Government Authorities should fford... » because it is not necessary in some countries, but there are other countries in which the Public Authorities must pass the necessary regulations to allow of commercial methods being introduced.

The President (in French). — I think this idea could be included in the wording suggested without changing it very much : « It is to be recommended that the Public Authorities should afford it the necessary facilities wherever possible, especially when it has lost its monopoly. »

Mr. Le Besnerais (in French). — Mr. President, mention is always made of State railways and private companies, but in actual fact there are other kinds of railways. There are the French railways, for example, which are private companies under State control; consequently it is wrong to mention nothing but private companies and State railways.

I would like the sentence proposed by Mr. Ashton Davies to be adopted first of all and then the addition : « Wherever necessary, the Government Authorities should afford the necessary facilities... »

Mr. Fiori, *Italian State Railways* (in French). — We might say : « In countries where this is necessary... »

The President (in French). — The suggestions made by Mr. Ashton Davies and Mr. Le Besnerais are that an addition be made after the sentence . « Speaking more generally, railways must continue to follow the commercial methods which have proved sound in other spheres of business », this addition being as follows : « especially since they now no longer enjoy a monopoly of transport. Whenever necessary, the Government Au-

thorities should support a policy of a commercial character... ».

We have succeeded in finding a text which pleases the English and German Reporters as well as the French Delegates. I think the Special Reporter will also agree to it.

Mr. Jarrigion (in French). — I am ready to accept the text suggested by our English Colleague. As for the second alteration suggested by Mr. Le Besnerais, I would like to have it made more explicit, because we have not been given any very explicit text, and in any case in this text I do not want the word « facilities », but that in countries where it is necessary the Public Authorities should « afford the means » instead of « give facilities ». The word « facilities » is so vague. It is not very clear in what such facilities could consist, even in France where there is State control, but where there is also a guarantee from the State. Consequently it is the general means that should be asked for to make commercial methods possible, and they could even be invoked in the case of the commercial methods of an intermediate company, as in the case of State control or nationalisation, as in found in many countries. This is why the word « means » is better.

The President (in French). — I do not think your suggestion is very important. I think we might stop at the wording which satisfies most of us.

Mr. Jarrigion (in French). — I thought we might come to an agreement with Mr. Le Besnerais.

Mr. Le Besnerais (in French). — Mr. President, perhaps everyone would be satisfied is we said : « Wherever necessary the Government Authorities should afford the railways the means to carry out a policy of a commercial character ».

The President (in French). — I am afraid that if we express a wish that the Government Authorities should give the railways means of assuring a commercial management, it makes it too imperative. « ... Necessary facilities to carry out a policy of a commercial character » is more accurate I think. There are cases when it is necessary to carry out a policy that will meet the public requirements, sometimes for military objects.

Mr. Le Besnerais (in French). — We might say : «should afford the Railways the necessary facilities to carry out a policy of a commercial character ». Do you agree, Mr. Jarrigion ?

Mr. Jarrigion (in French). — Yes.

The President (in French). — I will read the whole paragraph :

« Speaking more generally, Railways must continue to follow the commercial methods which have been proved sound in other spheres of business, especially since they now no longer enjoy a virtual monopoly of transport. Wherever necessary, it is desirable that Government Authorities should afford the Railways the necessary facilities to carry out a policy of a commercial character. »

— *Approved.*

The President (in French). — Gentlemen, this brings us to the end of the discussions on Question X.

I particularly wish to thank Mr. MELLINI, the Special Reporter, who was good enough to take Dr. Cottier's place during the discussions on the summaries for this question.

— The Meeting ended at 1 p. m.

DISCUSSION AT THE PLENARY MEETING

held on June 11th, 1937.

Mr. LE BESNERAIS, Vice President, in the Chair.
ENERAL SECRETARIES : MESSRS. P. GHILAIN, de BOYSSON and CAMBOURNAC.
SSISTANT GENERAL SECRETARIES : Sir H. Nigel GRESLEY and Dr. Th. KITTEL.

Mr. Ghilain, *General Secretary*. — now come to the examination of the nmaries for Question X, which were lished in No. 6 of the *Daily Journal he Session.*

– No remarks were made during this mination.

he President (in French). — We therefore take the summaries for stion X as agreed.

Summaries.

1. Under the influence of trade re-overy throughout the world, rail-borne affics generally show a certain in-ease which, however, falls short of ie general increase in production.

One of the primary causes why the nancial situation of railways is slow improving in most countries is the ct that exchange of goods between ifferent countries is handicapped by nport restrictions, systems of « clear-g », control of currency, and mone-ry instability.

It is therefore desirable, in the in-rests of the financial equilibrium of ansport undertakings, that artificial rriers limiting international com-erce should be lowered, and in so far possible, suppressed.

2. But the most important cause of e delay shown in the improvement « of the financial situation of Railways « lies in the continual development of « road transport competition.

« In fact, in every country, the num-« ber of motor vehicles and their load-« ing capacity are increasing, at the same « time as roads are being extended and « improved. The consequence is that « competition from road vehicles be-« comes more and more acute, and the « harmful results of this are reflected « in the general position of Railways.

« Although road transport must have « a place in the field of transport, the « question of its rightful place in that « field cannot yet be said to have been « answered with any degree of finality.

« 3. Railways are under legal obliga-« tion to ensure public transport in « accordance with principles dictated by « general public interests. The conse-« quence to Railways is that they have « special responsibilities not incumbent « on other methods of transport which, « not being bound by the same obliga-« tions to public interest, are free to « pick and choose their traffics, and fix « their tariffs.

« Under rational organization, road « transport should be complementary to, « rather than competitive with, rail « transport. It should, therefore, only « be encouraged to the extent to which « it is essential and affords a type of

« service not possible by rail. It is de-
« sirable, in particular, that special care
« should be taken to conserve long-
« distance and heavy traffics to the Rail-
« ways, whose economic status should, in
« the general interests, be preserved.

« 4. It is desirable that the closest pos-
« sible co-ordination should be brought
« about between Railways and road mo-
« tor vehicles offering a service to the
« public, notably by the following means:

« (*a*) By participation of Railways in
« road transport, a participation which
« may, in certain cases, extend as far
« as concentration under one manage-
« ment;

« (*b*) By an allocation of traffics bet-
« ween the two methods of transport,
« either by mutual agreement sanc-
« tioned by the Authorities, or by direct
« orders from the Authorities.

« (*c*) By substituting, for competitive
« road services, combined road-rail ser-
« vices such as containers, transport by
« rail of loaded lorries or trailers, etc.

« In order that efforts to coordinate
« public transport may not be nullified,
« it is also necessary that appropriate
« measures be taken to regulate private
« transport of goods by road motor, par-
« ticularly over long distances.

« The application of these various
« measures would require the existence
« of sufficient motor traffic statistics,
« such as are already drawn up in some
« countries.

« 5. With the object of avoiding un-
« fair competition, and to give to the
« patrons of road hauliers the necessary
« security (as also to other road users),
« the appropriate Authorities should :

« (*a*) Keep under strict observation all
« road vehicles and see that the trans-
« port bye-laws are carried out, through
« the intermediary of the police, with the
« main object of securing greater safety
« on the road;

« (*b*) Insist on all public road car-
« riers carrying out their responsibili-
« ties towards their clients, covering
« themselves against third-party risks in
« the same way the railways are obliged
« to do;

« (*c*) Ensure in respect of staff em-
« ployed in the public transport of both
« passengers and goods, working condi-
« tions comparable with those in force
« on the railways of the country.

« 6. In order to suit all economic
« needs, it is important that all methods
« of public transport adopt published
« tariffs, consistently applied, and based
« as far as possible on the same prin-
« ciples. If, in other respects, conditions
« of equality could be achieved between
« rail and road transport, the carrying
« out of such a measure would avoid the
« unnecessary reduction of their existing
« rates by both parties.

« Until such time as the difficulties
« inherent in the application of this
« measure have been solved, the Railways
« of most countries are compelled to re-
« sort to the lowering of rates.

« The reduction of rates in specific
« cases, sometimes granted only on con-
« dition that the firms concerned hand
« over the whole of their transport to
« the Railway, has been found to give
« better results than general rates re-
« duction.

« 7. On those services where working
« is to be continued by the railway, the
« improvement of passenger facilities, by
« increasing the speed and frequency of
« trains, as well as improvements in their

comfort, have proved to be efficacious means of meeting competition, and it is desirable to continue in this direction.

« On the goods side, experience has shown that regularity in delivery times, acceleration of transport, and extension of door-to-door facilities, are excellent means of increasing traffic, and should be adopted wherever possible.

« 8. The experience gained by the different Railway Administrations has shown the benefits obtained from suitable advertising and general propaganda. It is most desirable that all forms of advertising and propaganda be developed, that canvassing for traffic be intensified, that closer contact with clients be obtained in order better to understand their wishes and needs, and keep them informed as to « the various possibilities and advantages « to be derived from the use of the rail- « way.

« 9. Speaking more generally, Rail- « ways must continue to follow the com- « mercial methods which have been prov- « ed sound in other spheres of business, « especially since they now no longer « enjoy a virtual monopoly of transport.

« Wherever necessary, it is desirable « that Government Authorities should « afford the Railways the necessary fa- « cilities to carry out a policy of a com- « mercial character.

« It is also particularly desirable that « Railways introduce methods designed « to encourage the interest of employees « in the development of traffic and the « economic position of the railway ser- « vice. »

QUESTION XI.

Selection, orientation and instruction of railway staff.

Preliminary documents.

Report (Italy, Spain, Portugal and Colonies, Great Britain, Dominions and Colonies, America, China, Japan, Egypt), by Pietro Lo Balbo. (See *Bulletin*, October 1936, p. 1027, or separate issue No. 3.)

Report (Poland, Germany, Netherlands and Colonies, Denmark, Norway, Sweden, Finland), by J. Wojciechowski. (See *Bulletin*, November 1936, p. 1113, or separate issue No. 4.)

Report (Czechoslovakia, France and Colonies, Belgium and Colony, Luxemburg, Switzerland, Austria, Hungary, Jugoslavia, Bulgaria, Rumania, Greece, Turkey), by J. Hondl. (See *Bulletin*, May 1937, p. 1191, or separate issue No. 31.)

Special Reporter : J. Wojciechowski. (*See Bulletin*, June 1937, p. 1588.)

SECTIONAL DISCUSSION.

Meeting held on June 4th, 1937.

Prof. Dr.-Ing. WASIUTYNSKI in the Chair.

The Meeting was opened at 9.30 a.m.

The President (in French). — Gentlemen, Question XI, which is to be discussed today, is entitled : « Selection, orientation and instruction of railway staff ». I am sorry to have to tell you that the Special Reporter, Mr. Wojciechowski, is ill, and therefore unable to attend the Congress. The special report on the Question XI will therefore be presented by Mr. Targonski, Manager of Psychotechnical Research on the Polish State Railways, in his place.

I call upon Mr. Targonski to begin the proceedings.

Mr. Targonski, *Special reporter* (in French). — Gentlemen, owing to the illness of the Special Reporter, Mr. Wojciechowski, Engineer, I have been appointed to take his place and give you his special report. The latter is a summary of the reports drawn up by Messrs. Hondl, Lo Balbo and Wojciechowski, for the countries assigned to them.

These reports, which are very well documented and full of precise information, form, with Mr. Wojciechowski's special report, a very valuable contribution to the investigation into this question.

These reports were sent or distributed to all the Delegates to the Congress, so that everyone has had the opportunity of studying them.

will merely recall the most important
nts, together with the summaries to
drawn from these documents.
hese findings are as follows :

As regards the selection of staff, the
rters found that :

Psychotechnics are being applied grad-
y by many (18) Railway Administrations
consider this method as an indispensable
or of a rational selection of their staff.

Psychotechnics tend to increase the
's output and to reduce the number of
dents due to the human element.

The coefficient of concordance of the
essional value of railway staff in actual
ice, as compared with the results of the
hotechnical examinations, is between 70
90 %.

Psychotechnical methods, applied to the
essional training of staff, promise to
e it more rapid, efficient and less costly.

The psychotechnical methods adopted by
different Administrations are not uni-
; some tests are used which differ more
ess in kind and number.

view of the results of the examination
ne question, it was thought advisable to
mmend to all the Railway Administra-
s :

To introduce psychotechnical methods
he selection of their employees, in order
ontribute to the development of this
science.

To standardize methods of psychotech-
tests by favouring the exchange of
s and experience.

The professional guidance of staff is
applied according to the results of the
hotechnical examinations, owing to the
that these examinations are exclusively
ed to candidates for given duties.

Methodical education of candidates for
various departments, as well as the im-
ement of staff already in service, usually
the form of schools and special lectures.

It must be recognized that such education is given in rather various ways.

The introduction of psychotechnics during the course of such instruction takes place only on the German State Railways, and is seems advisable for all the other Railway Administrations to adopt the same methods.

The President (in French). — You will notice that Mr. Targonski's résumé has been made in the form of summaries somewhat more fully developped than those of Mr. Wojciechowski's Special Report, but the subject matter is, in fact, approximately the same.

I think we can go straight on to the discussion of the different points of this resumé. However, before starting the general discussions, I would like to know if the other Reporters have anything to add.

Mr. Hondl, *Reporter* (in French). — Gentlemen, as Mr. Wojciechowski's special report is so very thorough, I am convinced that I have nothing to add as far as my report is concerned.

However, I would like to point out that Rumania should be crossed off the list of countries whose railways have not so far applied psychotechnical methods in the selection of their staff, as given on page 1589/103 of the separate edition of the special reports. The Rumanian State Railways, as I reported on page 466/46 of my report, introduced such methods in 1936. They have not yet had time to supply any useful information thereon, nor to express their opinion about the results obtained.

I am entirely in agreement with the summaries suggested by the Special Reporter, which are similar to those given on page 477/37 of my report. But, if you will allow me, Mr. President, I would like to add a few considerations of a

general kind about the selection of railway staff on the basis of psychotechnical investigations.

Psychotechnics are no longer an attempt to find a way, but have asserted themselves in practice, and their practitioners can testify to its success; psychotechnics can in this way contribute towards solving certain difficult problems which the economic crisis of our time has given rise to. It is above all due to the psychotechnicians that it is possible to form judgments about human beings, who after all are not purely machines.

Modern industry and commerce have largely modified the conditions the staff are called upon to fulfil. Psychotechnics, by studying the scientific bases for the formation of apprentices and training of workmen and clerical staff, have obtained very unexpected results in this field, which will prove of great practical value.

For some time, psychotechnics have been working in close collaboration with medecine, because certain jobs or posts are apt to bring about special diseases, or accidents, and it is the duty of psychotechnics to trace, thanks to a pre-selective examination, those that are naturally exposed to the accidents or diseases in question.

We have also invested psychotechnics with a new role. The economic crisis has thrown a great many individuals out of work. New opportunities for work must be made available, taking into account the fact that the new ways of living must be in accordance with individual capacities. We often come up against opposition from those who pretend that psychotechnics are of no value, but I am convinced that they can be credited with useful and concrete results, whenever they have been used.

Finally, Gentlemen, I would like to call your attention to the fact that statistic of accidents should be drawn up on rational basis. Already psychotechnic have made it possible to eliminate i advance very effectively those who ar predisposed to accidents, which mea damages for the employee and loss for th employer.

The President (in French). — I not that Mr. Hondl's remarks do not impl any changes in the proposed summaries His only suggestion actually is the orga nisation of a statistics service, a matte dealt with in Chapter I, point 3.

Mr. Hondl (in French). — I merel wanted to call your attention to thi question.

The President (in French). — Befor continuing the general discussions, I war to know if any Delegates want an Englis or German translation of Mr. Targonski' resumé ? Otherwise, we will merel translate the summaries.

— (*After hearing the views of th Meeting, it is decided to tranlate only th summaries.*)

Mr. Lo Balbo, *Reporter* (in French — Mr. President, Gentlemen, I am i complete agreement with the Special Re porter's summaries, but I would like t add that psychotechnics as applied on th railway have, in fact, a double characte First of all their essential object is orga nised safety in working, so as to avoi damage to persons and stock. Secondly psychotechnics have an economic value i the sense that they are intended to mak it possible to choose the staff and th most suitable methods in order to ge increased efficiency.

To make it possible for psychotechnic to be generally applied in a more practica

nner, I would like the possibility of uping several companies to be exaned, with the location of the psychohnical service at a common centre. ch railway would be able to share rein, by making a given payment for h employee. This system could be used the case of the greater part of the ff. This would mean that psychotechs could really become an indispense factor in the rational selection of lway staff.

The President (in French). — If the mpanies prefer to organise their own arate psychotechnical examinations, y cannot be prevented from so ng; it depends entirely on their own nions. It is naturally desirable to ndardise the examinations, and orgae them in a thoroughly satisfactory nner, and it is to be recommended t railways which are not equipped to this themselves should apply to aner common organisation.

Mr. Torres, *Benguela Railways* (in nch). — Like Mr. Lo Balbo, I am in nplete agreement with the Special Rter's summaries, but I would like to ke a few remarks about the professnal training of the staff, when they t work on the railway.

Today, as you all know, the greatest portance is attached to professional ining, as this is one of the main facs in the progress and even the proper nagement of the railway. I am refer to technical training. Technical edu-on, in its higher and intermediate des, is the training given to engineers, pectors, foremen, drivers, etc. But I nk the most important part of all is t of the elementary technical training, en it is a question of solving the pret day railway problems.

I am now referring in particular to the training given in the elementary technical schools, to prepare those who will ultimately be employed by the railway in its stations or offices.

I wish to recommend that the Governments introduce — in principle and according to circumstances — in the elementary stages of public technical education, rudimentary instruction about railway operation, taking into account in particular the function and modern commercial management, and aiming towards the possible preparation of candidates for the elementary posts in stations and offices, as, especially in some countries, many difficulties are experienced with these employees on account of their complete lack of preparation and utter deficiency in the railway spirit.

In fact, just as the railway depends for its progress on the intermediate and higher grades of technical knowledge, as far as the future is concerned it will find its best support in the elementary stages of such instruction, from the point of view of the modern commercial training of all men of the outdoors operating services.

The President (in French). — I understand you to say, Mr. Torres, that you recommend the introduction of preparatory instruction in railway matters in the elementary stages of general technical education; this is divided in fact into several categories : there are the elementary, secondary, and higher railway schools.

Mr. Torres (in French). — In every country there are three stages in general technical education : higher, intermediate and elementary. In the higher and intermediate schools, engineers and foremen are trained. I suggest including in the

recommendations of the Congress a suggestion that the Governments should include railway training in their technical education facilities. This includes the commercial and technical sides which correspond precisely to the present requirements for the instruction of men entering the railway at the bottom of the ladder. It should be recommended that the Governments revise the syllabus, and introduce technical railway training in the schools.

The President (in French). — Are there any further remarks before we go on to the detailed examination of the summaries ?

Dr. Filippini, *Italian State Railways* (in French). — I think that we are all agreed that psychotechnical methods are extremely useful in examining railway employees. But, though it is agreed that psychotechnics are very important, we must not generalise unduly. We must not be deluded, and think that psychotechnics can solve all the problems of selecting railway employees, but remember that psychotechnical examinations are costly and take up much time. Bear in mind that the examination of each individual always takes 4 to 5 hours, so that you can see how long it takes to examine all the candidates for railway employment.

I think that psychotechnics should be applied above all to employees for certain specialised functions such as the drivers of express trains, drivers in general, signalmen, etc. On the other hand, such examinations are not justified in the case of clerical staff, labourers, etc.

Psychotechnics also play a great part in the professional guidance of apprentices. The latter should be examined psychotechnically before being attached to any particular branch of the servic

Most important of all, however, I thir psychotechnics should be applied outsi the individual sphere and be used to i vestigate the conditions under which t employee works. It is not only t individual who should be examined, b the conditions under which he works.

For example, take railcars; certain rai ways always paint these grey, very muc the same colour as the ballast. Now, the railcars move very fast and cannot alway be seen a long way away when painte such a colour. We have had several acc dents owing to this, whereas had the rai cars been painted some other colour, re for example, the men would have see them much further off.

Another example : in certain marshal ing yards, sodium lamps, which give yellow light, are used; these are ver suitable for the work, but in the lon run may be tiring for the workers.

It is little problems of this kind whic come within the sphere of psychotechnic and should be taken into account in th enquiries into working accidents.

There are many employees who ar very subject to accidents; they are foun to be nearly always the same. Statistic of accidents at work prove this. It shoul be noted that certain employees have ha the same accidents three or four time

Mr. Jarrigion, *Ministry of Publi Works, France* (in French). — In con nection with the selection and profes sional guidance, as well as psychotech nical examinations, I would like to as the Section to recommend that this ques tion be not limited to a simple conside ration of the scientific results, but als take into account its human and socia character.

I am aware of the fact that on certai railways the examination is not mad

h the sole object of selecting the staff, directing its work into the most able channels. The staff, however, der certain circumstances, may be der the impression that these psycho-nical examinations are intended to minate them. This is just what must avoided. Care must be taken to see t the staff do not suffer from the pression that there is any risk of their ng their work on the railway through se psychotechnical examinations.

t is therefore desirable that, whilst ecting the men most suitable for given ies, the railway should not profit by h examinations to reject any em-yees, but take pains to see that they found some other occupation so that y will be able to keep their work and n the same wages as in the past.

This, I can assure you, is what the ff want. I consider that there is a social aspect which must not be sight of, because the extension of se psychotechnical examinations leads men being thrown out of work, and these men must live and they can y do so at the expense of those who l be selected.

This is the recommendation I want the tion to take into account, and I am vinced that if this is done, the rail-y staff will be more favourably dis-ed towards the psychotechnical exa-nations they are required to undergo.

The President (in French). — Gent-men, safety of working is one of the me necessities of the railway. In my nion it is impossible to be too exact-when choosing those on whose work safety of the railway depends. Na-ally when examining men already em-yed on the railway, those who do not sfy certain conditions for a given post, must be found other posts; but it is impossible to be easy going when selecting new recruits.

Gentlemen, we now come to the detailed examination of the Special Reporter's summaries.

I want to call your attention to the following point : we have been discussing psychotechnics all the time, but Question XI includes three distinct points : I, Selection; II, Orientation; and III, Training. I want to point out that the Special Reporter has very properly arranged his summaries under these three headings.

I am now going to read Summary 1 about the selection of the staff :

I. As regards the selection of staff, the reporters found that :

1. Psychotechnics are being applied gradually by many (18) Railway Administrations who consider this method as an indispensable factor of a rational selection of their staff.

This first point is a statement based on the reports.

Has anyone anything to say about this wording ?

— *Summary 1 was adopted as it stood.*

The President (in French). — To go on to *Point 2 :*

2. Psychotechnics tend to increase the staff's output and to reduce the number of accidents due to the human element.

This again is a statement based on the reports. The Reporters stressed the fact that statistics of accidents prove that the use of psychotechnics is of assistance in reducing the number of accidents.

Mr. Lévy, *French State Railways* (in French). — The word « output » seems to imply the quantity of the work. I think it would be advisable to add to

« output » the words « and the quality of the work ».

Mr. Panaitopol, *Rumanian State Railways* (in French). — I think that in speaking of the output of the staff, both the quantity and the quality are generally included. It would appear superfluous to mention both the quantity and quality of the output. I suppose this is what Mr. Lévy means ?

Mr. Lévy (in French). — I made my observation because the meaning of the French word « rendement » is rather restricted.

The President (in French). — I do not think this addition is absolutely necessary, but it would not upset the meaning of the sentence.

Mr. Panaitopol (in French). — I would agree to putting « quantity and quality of output ».

The President (in French). — Does everyone agree to this modification ?

— *Summary 2 was agreed with the modification : « ... quantity and quality of the staff's output. »*

The President (in French). — We come to *Point 3 :*

3. The coefficient of concordance of the professional value of railway staff in actual service as compared with the results of the psychotechnical examinations, it between 70 and 90 %.

I think Summary 3 is an important statement in favour of psychotechnical examinations.

— *Summary 3 was adopted without remark.*

The President (in French). — *Summary 4 :*

4. Psychotechnical methods applied to th professional training of staff promise to mak it more rapid, efficient and less costly.

— *Adopted without alteration.*

The President (in French). — The we have *Point 5 :*

5. The psychotechnical methods adopte by the different Administrations are no uniform; some tests are used which diffe more or less in kind and number.

Any remarks ?

— *The Meeting agreed to this sum mary.*

The President (in French). — Afte these statements based on the informa tion given in the reports, the Special Re porter suggests the following summarie referring to the selection of the staff this is the most important part of hi work. We will consider the text poin by point.

In view of the results of the examinatio of the question, it is thought advisable recommend to all the Railway Administra tions :

1. To introduce psychotechnical metho for the selection of their employees, in orde to contribute to the development of this ne science.

Mr. Panaitopol (in French). — I d not think the text is altogether suitable it would be better to change the wordin a little like this :

« To introduce psychotechnical metho for the selection of their employees *an to contribute* to the development of th new science ».

Mr. Mayer, *Nord-Belge Lines, Belgiu*

French). — Mr. President, it is not gether certain that it is accurate to psychotechnics a science in the pre- t stage of development. Would it not more prudent to say « this method » this « discipline » ? It may be an art, ner than a science. I think the word ethod » would be best.

The President (in French). — Gent- en, does everyone agree about this ? e end of the paragraph would be : . and to contribute to the development this method ».

— *The text of Summary 1 was adopted the following form :*

1. To introduce psychotechnical me- ds for the selection of their em- yees and to contribute to the deve- ment of these methods. »

The President (in French). — Here is *nmary 2 :*

To standardize methods of psychotech- l tests by favouring the exchange of vs and experience.

Mr. Goursat, *French Nord Railway* (in nch). — Gentlemen, this recommen- on consists of two parts : one deals n the collaboration of the psycho- nical services of the different rail- s, according to an international plan. s is the important point, and I quite e with this recommendation, but if sible I would like it to be extended further by saying that a closer colla- ation of all the railways is desirable hat each could profit by the investi- ons and experiences of the others. s for the second recommendation : I k it is rather ambitious to deal with t present. All the railways do not use hotechnics with the same object : e of them use it at the beginning, i. e. when selecting candidates for rail- way employment, while others use it to select the candidates for certain duties, and sometimes to check if the employees, who have to carry out these functions, have the capacity to do so.

Though it is possible without too much difficulty to standardize psychotechnical entrance examinations, it is much more difficult to standardize the methods used to select the staff for different func- tions because these usually differ from one railway to another. I think it would be necessary, therefore, to limit the standardization of the psychotech- nical methods to certain functions, e. g. those affecting the safety, which are the same on all railways : signalmen, loco- motive drivers, railcar drivers, etc., with- out trying to generally extend these standardized methods, because we are very far from being able to do so.

The President (in French). — If I have understood you aright, M. Goursat, it is a question of standardizing the me- thods used in psychotechnical examina- tions.

Mr. Goursat (in French). — Only in certain cases.

The President (in French). — You mean that it is a question of standardiz- ing the methods used in psychotechnical examinations, i. e. the tests for each cate- gory of employees separately. Naturally, signalmen and drivers, should not be examined in the same way.

Mr. Goursat (in French). — It is not a question of a standard test for both drivers and signalmen; it is a question of standardizing the tests used for drivers on all the railways. We must not try to get standard methods for more diffi-

cult and altogether different functions, such as station master, office clerk, etc.; just as the functions differ, the aptitudes required vary.

Mr. Panaitopol (in French). — I should be much obliged if our colleague, Mr. Goursat, would give us a written text for his suggestion.

Mr. Hondl (in German). — I want to acquaint the Meeting with the fact that a Congress of Applied Psychotechnics was held in Prague, in 1934. Certain Railway Delegates attended this Congress, including perhaps Delegates from the French railways. A special committee was elected to deal precisely with the standardisation of the professional selection methods. I would like to know if any Delegates present here are amongst those who attended the Prague Congress, or were members of the Committee in question, and could give us any details about the work done and the results obtained since then ?

Mr. Filippini (in French). — I can answer Mr. Hondl's question about the Prague Committee.

This Committee met in Paris under the presidency of Mr. Lahy. We were received by the Management of the Nord Railway. We made certain investigations, but there the matter stopped.

The President (in French). — I would like to know if any decisions were made at that meeting? I want to remind you again that it has been suggested that the wording of the second summary should be slightly altered.

Mr. Filippini (in French). — In connection with Summary 2, I do not think we can talk about standardization. There is no precise method which can be applied to the tests.

I remember that at the same Prague Congress, it was stated that standardization had not been reached in the case of the same categories of workers and work. Standardization is, therefore, not possible. Mr. Wojciechowski found different results at Wilno and Warsaw, two places in one and the same country.

The President (in French). — All the same I think such standardization should be considered.

Would you agree to the text if Mr. Goursat's modification was made ?

Mr. Goursat (in French). — When a man enters the railway service, he is put to any sort of work; he is a labourer Before he is taken on, he must be proved to have certain qualities. On the other hand, the candidates for particular functions are selected, i. e. signalmen, locomotive drivers, or railcar drivers. Before being appointed they undergo certain psychotechnical tests, which are much more specialized tests, seeing that the object is to verify their aptitude for certain duties...

The President (in French). — Employees already in service are also submitted to tests.

Mr. Goursat (in French). — *A priori,* it is the same qualities I require.

The President (in French). — The second part of the summary applies to both recruits and employees...

Mr. Goursat. — ... to recruits and employees, if you like.

Mr. Lo Balbo (in French). — After

word « standardize » I would like to « ... as far as possible », or « standdize within the possible limits ».

The President (in French). — The eword to the summary says : it seems irable to recommend. If we say « it ns desirable » we are not saying ust be ».

Mr. Bacqueyrisse, *Local French Organization Committee* (in French). — It uld be desirable for all those on whose k safety rests, to undergo periodic minations. We talk about the emyees in general; at the beginning we talked about the men in service.

The President (in French). — This is ew point you are raising. But I do think it is a question which can be gested here, but should be left to the ice of the Railways.

Delegate (in French). — May I inupon one thing. When the mem of this Congress visited the laboraof the « Société des Transports en mun de la région parisienne » we ved them what was done there. We e our men undergo periodical tests. you know how many men are elimin after accidents? About 30 % are nd to be unsuitable after an accident ough they passed the original tests. proves that they have become unable after their first psychotechnical mination. Consequently it is a good g to make them pass periodical examions.

The President (in French). — If I untand this rightly, this last proposal ns making another addition : « ... to oduce periodical tests for the emees in the interests of safety ».

Do you think, Gentlemen, that this third point can be included ?

Mr. Perdieus, *Belgian National Light Railways Company* (in French). — I want to say a word about the addition suggested by Mr. Lo Balbo. I am in complete agreement with this. At the present time we are a very long way off standardization. I do not think, however, that we should add « as far as possible », because we are so far from achievement that we must be careful not to discourage anyone.

The President (in French). — I am of the same opinion. I now want the Meeting to vote about the new addition : « to make employees engaged in certain duties pass periodical examinations in the interest of safety ». My own opinion is that it should be left to the railways to see to it; I am sure that each of them as a general rule finds itself obliged to repeat all the tests; men of the permanent-way, locomotive running, or operating departments all have to take the examination again while actually in service.

Mr. Lévy (in French). — I think that periodical psychotechnical examinations should not be recommended in all cases, but in certain cases, for example, especially after accidents.

The President (in French). — I am going to read the new wording of Summary 2, which takes into account the various suggestions made :

« 2. To standardize methods of psychotechnical tests applied to candidates to the railway service, especially to certain functions dealing with working safety (signalmen and pointsmen, engine drivers and drivers of railcars) and to favour in the best possible manner the

exchange of views and experience acquired in this connection. »

Then comes the new point 3 about the utility of periodical examinations :

« 3. To take into consideration the usefulness of periodical examinations for certain functions in connection with the safety of the working. »

— *These two texts were approved by the Meeting.*

The President (in French). — We now come to Summary 3, which becomes the new summary 4 :

3. To introduce into their statistics of accidents a more precise qualification of their causes due to the human element, conjointly with the results of the psychotechnical examinations.

Mr. Panaitopol (in French). — I think it would be better to say : « of *the* causes dues... » instead of « of their causes due... »

The President (in French). — Does everyone agree about this change ?

— *This point was agreed as new Summary 4, with the amendment made by Mr. Panaitopol.*

The President (in French). — This finishes the part relating to the selection of the staff.

We now come to Chapter II dealing with *Professional guidance.*

II. The professional guidance of staff is not applied according to the results of the psychotechnical examinations, owing to the fact that these examinations are exclusively applied to candidates for given duties.

Mr. Panaitopol (in French). — I note that the Special Reporter is just making a simple statement here, and is not making any recommendations. I do not think this is sufficient. I would like my Colleagues who have had more experience in this matter to tell me whether they are of the same opinion.

I know, for example, that in Rumania, psychotechnical methods are not used for this purpose by the railways, though they are used in many other industries, especially in the case of giving professional guidance to children. I am surprised to find that psychotechnical methods are not used for this purpose.

Mr. Lo Balbo (in French). — I would like to state, in this connection, that the three reports are more particularly concerned with psychotechnics because the question of the instruction of railway staff has already been investigated in detail at previous Sessions.

In my report, I mentioned that in the case of the selection, professional guidance, and training of railway staff, nearly everywhere a suitable standard of education for the employee's first job is required.

May I ask the President if he will be good enough to get the Permanent Commission to agree to include the question of the professional guidance of the staff according to psychotechnical methods, on the agenda for the next Congress.

It is a complex question which should be investigated once again.

Mr. Panaitopol (in French). — I propose the following addition to Chapter II :

« Seeing that the professional guidance of the staff according to psychotechnical methods seems to be of special interest, the Meeting proposes that this matter be placed on the agenda of the 14th Session of the International Railway Congress Association. »

Mr. Lo Balbo (in French). — This is at I wanted to ask the President to do.

Dr. Filippini (in French). — On the lian State Railways we have introduced method which is of some value; when en men have passed an entrance exa- nation and are not accepted, we use e very complete data available about em in order to endeavour to guide them wards another career. This may be lled a by-product of professional gui- nce.

— *Chapter II was adopted with the dition proposed by Messrs. Lo Balbo d Panaitopol.*

The President (in French). — Then ere is Chapter III, dealing with *pro- ssional training.*

Here is the text :

II. Methodical education of candidates for e various departments as well as the im- ovement of staff already in service usually es the form of schools and special lectures. t must be recognized that such education given in rather various ways.

The introduction of psychotechnics during e course of such instruction takes place ly on the German State Railways, and it ems advisable for all the other Railway lministrations to adopt the same methods.

Mr. Giovene, *Italian State Railways* (in ench). — The title chosen for Ques- n XI refers in particular to the mo- rn psychotechnical methods and the actice of professional guidance, but it o includes the professional training of e staff. The latter subject has been alt with in the three reports, but in ual fact rather from the point of view training new employees and of appren- eship, i. e. the ordinary professional ining of the staff. The professional rmation of the staff takes place during ir actual employment, by degrees, and generally by passing through successive stages of employment.

In this connection, I think it opportune to remark that in recent years the improvements and innovations introduced have been so many and so far reaching, that it is absolutely necessary for the main-line railways to organise regular courses in order to teach the staff already employed the fundamental points about new equipment and methods.

As the eminent President of our Association said, with such great authority, at the inaugural meeting, it is no longer a question of the railway having to perfect and improve, but it must create; with the rapid and extensive change-over from steam to electric traction, with the introduction of new methods of traction, with the replacement of the old simple signalling equipment by more complicated improved installations such as centralised electrically-operated signal boxes, with the introduction of more flexible and commercial methods of operating, the railways have indeed courageously embarked upon a creative policy.

For this bold policy to be successful, one point must not be neglected : the evolution of the staff, who must be adapted as quickly as possible to the new functions, new systems, and new ideas.

This is the modern reason for the importance of professional instruction, with the object of bringing the knowledge and work of the staff employed, thoroughly up to date.

The Italian State Railways have recognised this necessity, and have organised regular courses for their men in the different departments.

I might add many more details about this matter, unfortunately there is no time.

Under these conditions, I think it would be as well to include in the sum-

maries for Question XI a paragraph about professional training, in the above sense.

The President (in French). — Can Mr. Giovene give us a text about this ?

Mr. Giovene (in French). — We might say :

« The Meeting expresses the desire that, together with the transformation of installations and ways and means of operation, already in progress, the various Administrations consider the necessity of adapting to the new state of affairs the education of staff already in service, by means of specially organised training courses. »

The President (in French). — Does everyone agree about this addition t Chapter III of the summaries? (*Agreed*)

This brings us to the end of the dis cussions on Question XI. I would lik to know if Mr. Targonski, the Specia Reporter, has any further observation to make ?

Mr. Targonski (in French). — No, Mr President.

The President (in French). — Gent lemen, in the name of the Section, I wan to thank our Special Reporter, Mr. Tar gonski, who has been so skilful in con densing the opinions of the Reporter into such precise summaries.

— The Meeting ended at 12.30 p. m.

DISCUSSION AT THE PLENARY MEETING

held on June 7th, 1937.

Mr. HENRY-GREARD, Vice-President, in the Chair.

General Secretaries : Messrs. P. GHILAIN, de BOYSSON and CAMBOURNAC.

Assistant General Secretaries : Sir H. Nigel GRESLEY and Dr. Th. KITTEL.

The President. — We will now examine the Summaries for Question XI.

I call upon Mr. Ghilain, the General Secretary, to read these out.

Mr. Ghilain, *General Secretary.* — The text of the Summaries for Question XI was published in the *Daily Journal of the Session,* No. 4, of June 5th.

(*Mr. Ghilain read all the summaries in turn.*)

The recommendation expressed in point 4 of chapter I :

« 4. To introduce into their statistics of accidents a more precise qualification of causes due to the human element, conjointly with the results of the psychotechnical examinations » gave rise to an exchange of views, as hereafter.

The President (in French). — As regards Point 4, which has just been read, I have been asking myself whether this paragraph would not be clearer if worded like this : ... « conjointly with the result of the psychotechnical examinations of the members of the personnel involved in these accidents »; this would clearly show that there is a bond between the psychotechnical examinations and the accidents referred to. I wish to ask Mr. Wasiutynski, President of the 4th Section, if he has any objection thereto.

Dr. Wasiutynski, *Ministry of Communications, Poland* (in French). — I agree to the proposed addition, which makes the meaning of this paragraph quite clear.

The President (in French). — I thought so.

Dr. Wasiutynski (in French). — The wording may be completed as requested by the President. I quite agree.

The President (in French). — The President of the 4th Section being in agreement, and if there are no other objections, Clause 4 will be worded as follows :

« 4. To introduce into their statistics of accidents a more precise qualification of causes due to the human element, conjointly with the results of the psychotechnical examinations of the members of the personnel involved in these accidents. »

— *Approved.*

— *No objections were raised in connection with the other items.*

The President (in French). — The summaries for Question XI are consequently ratified, with an addition to point 4.

Summaries.

« I. As regards the selection of staff,
« the reporters found that :

« 1. Psychotechnics are being applied « gradually by many (18) Railway Ad- « ministrations who consider this me- « thod as an indispensable factor of a « rational selection of their staff.

« 2. Psychotechnics tend to increase « the quality and quantity of the staff's « output and to reduce the number of « accidents due to the human element.

« 3. The coefficient of concordance of « the professional value of railway staff « in actual service as compared with the « results of the psychotechnical exami- « nations, is between 70 and 90 %.

« 4. Psychotechnical methods applied « to the professional training of staff « promise to make it more rapid, effi- « cient and less costly.

« 5. The psychotechnical methods « adopted by the different Administra- « tions are not uniform; some tests are « used which differ more or less in kind « and number.

« In view of the results of the exami- « nation of the question, it is thought « advisable to recommend to all the Rail- « way Administrations :

« 1. To introduce psychotechnical me- « thods for the selection of their em- « ployees and to contribute to the deve- « lopment of these methods.

« 2. To standardize methods of psy- « chotechnical tests applied to candida- « tes to the railway service, especially to « certain functions dealing with working « safety (signalmen and pointsmen, en- « gine drivers and drivers of railcars) « and to favour in the best possible « manner the exchange of views and ex- « perience acquired in this connection.

« 3. To take into consideration the « usefulness of periodical examinations « for certain functions in connection « with the safety of the working.

« 4. To introduce into their statistics « of accidents a more precise qualifica- « tion of causes due to the human ele- « ment, conjointly with the result of the « psychotechnical examinations of the « members of the personnel involved in « these accidents.

« II. The professional guidance of « staff is not applied according to the « results of the psychotechnical exami- « nations owing to the fact that these « examinations are exclusively applied « to candidates for given duties.

« Seeing that the professional gui- « dance of the staff according to psy- « chotechnical methods seems to be of « special interest, the Meeting proposes « that this matter be placed on the agen- « da of the 14th Session of the Interna- « tional Railway Congress Association.

« III. Methodical education of candi- « dates for the various departments as « well as the improvement of staff al- « ready in service usually takes the form « of schools and special lectures.

« Il must be recognized that such edu- « cation is given in rather various ways.

« The introduction of psychotechnics « during the course of such instruction « takes place only on the German State « Railways, and it seems advisable for « all the other Railway Administrations « to adopt the same methods.

« The Meeting expresses the desire « that, together with the transformation « of installations and ways and means « of operation, already in progress, the « various Administrations consider the « necessity of adapting to the new state « of affairs the education of staff al- « ready in service, by means of specially « organised training courses. »

h Section : LIGHT RAILWAYS AND COLONIAL RAILWAYS.

INAUGURAL MEETING

held on June 2nd, 1937.

PROVISIONAL CHAIRMAN : MR. F. FIORI,
MEMBER OF THE PERMANENT COMMISSION OF THE ASSOCIATION.

— The Meeting opened at 9 a.m.

The Chairman (in French). — Gentmen, I have been requested by the Peranent Commission to preside over the ening Meeting of the 5th Section, and make up its Secretariat.

On behalf of the Permanent Commison, I suggest that Mr. MELLINI, Inspecur Supérieur de Vigilance à l'Inspecot général des Chemins de fer, Tramys et Automobiles (Italy), be appointed President of the Section. (*Applause.*)

— *Mr. Mellini then took over the hair.*

The President (in French). — Gentmen, and dear Colleagues, I first of all sh to warmly thank the Permanent ommission for the honour done to me appointing me as President of the 5th ction. I also wish to thank all Memrs present here for the kindness with hich they greeted this appointment.

Gentlemen, four years ago we parted mpany at Cairo, at the close of the portant XIIth Session, of which we ve very pleasant memories, and now we eet again in the wonderful City of Pas, in order to hold a still more imporit Congress.

It was hardly possible to select a better date for this Session, as it is that on which the International Exhibition opens its gates.

These imposing Meetings of railway technicians are useful, not only to discuss the most important land transport questions, but also to create bonds of sympathy and cordiality which facilitate the study of conclusions of an international character.

All the railway problems with which we have to deal here have grown in importance during recent years, and require general solutions which it will be our task to study very carefully, taking our time over them, in order that they may be used as guiding principles in all countries.

This time the 5th Section has to investigate the following questions.

« Co-ordination of operation as between main-line and light railways.

« Specifications for the fixed plant of railways with light traffic, intended to prevent the use of unnecessarily expensive track equipment, and generally to give economical working ».

Gentlemen, I think I will voice the feelings of the whole Meeting, if I conclude

by heartily greeting and warmly thanking all the Members of the great French Railway Family. (*Applause.*)

We now have to make up the Bureau of our Section; the Permanent Commission proposes to appoint as *Vice-Presidents :*

Mr. Th. H. WATERMEYER, General Manager, South African Railways and Harbours;

Lt. Col. R. E. GORDON, Executive Engineer, North Western Railway (India);

Dr. C. C. WANG, Representative of the Chinese Ministry of Railways in England, Member of the Permanent Commission of the Association;

Dr. O. DE SENN, Secretary of State, President, Royal Hungarian State Railways, Member of the Permanent Commission of the Association;

and as *Principal Secretary :*

Mr. A. ALLARD, Manager, Belgian National Light Railways Company.

— *These proposals were greeted with cheers.*

— On the suggestion of the President the Section completed the Bureau and drew up a provisional agenda.

— The Meeting was then suspended.

Revision of the Rules and Regulations of the International Railway Congress Association.

The Meeting was resumed at 9.15 a. m.

The President (in French). — Gentlemen, our first task is to examine a question of an administrative nature. As you are aware, the Permanent Commission put on the Agenda of the XIIIth Congress, the revision of articles 2 and 4 of the Rules and Regulations of our Association.

— (*The President then read the proposed alterations*) (*).

For my part, I see no objection to giving our agreement as regards these modifications.

Mr. Fiori, *Italian State Railways, and Member of the Permanent Commission of the Association* (in French). — As the only Member of the Permanent Commission present here, I wish to briefly explain the object of these small modifications to the Rules. It is merely a question of simplifying the procedure in connection with the admission of new Countries into our Association, and consequently, of new Members.

Formerly, the Permanent Commission could alter only provisionally the list of countries to which our Association extends, and such decision had to be ratified by the next Congress. This procedure has been deemed too slow, and according to the proposed new Articles 2 (4th paragraph), and 4 (1st paragraph) the Permanent Commission will be empowered to admit, by a written ballot

(*) See wording of the proposed alterations in the September 1937 number of this *Bulletin*, p. 1962 (Summary of Proceedings, Paris Congress, 1937), and revised Rules and Regulations in the January 1938 number, p. 98.

iving a majority of 3/4rs of the votes f its Members, a new country into our ssociation.

The President (in French). — Is the leeting in agreement with the proposed lterations. *(The Meeting signified its dhesion thereto.)*

On the other hand, according to lause 21 of the Rules and Regulations, e have to appoint a delegate to attend the Special Meeting who will examine the proposed revision.

Mr. Tosti, *Italian State Railways* (in French). — I propose that our President, Mr. Mellini, be delegated. (*Approved.*)

The President (in French). — I am deeply moved by this token of sympathy, and I offer my best thanks to the Meeting.

— The Meeting was then closed.

[625. 61 (01)]

QUESTION XII.

Co-ordination of operation as between main-line and light railways.

Preliminary documents.

Report (All countries), by Messrs. Belmonte and Tosti. (See *Bulletin*, May 1937, p. 1225, or separate issue No. 33.)

Special Reporter : Mr. Belmonte. (See *Bulletin*, June 1937, p. 1595.)

SECTIONAL DISCUSSION.

Joint Meeting held on June 8th, 1937, by the 3rd and 5th Sections.

Mr. MELLINI in the Chair.

— The Meeting opened at 9.30 a. m.

The President (in French). — Gentlemen, today we are going to discuss Question XII : « Co-ordination of operation as between main-line and light railways ».

As you know, this Question will be examined in common with the Third Section.

I must warmly thank the eminent President of the third Section, Mr. Pellarin, as well as the Members of this Section, for their kind collaboration with us in examining this Question.

I am sorry to say, however, that I have been appointed to take over the duties of Special Reporter for the Fourth Section, which is discussing Question X : « Effects of the world crisis and road competition on the railway position », and consequently I must give up my place as President to Mr. Pellarin, whose thorough knowledge about railway operation makes him particularly competent to preside over the discussions.

Mr. Pellarin, I shall be obliged if you will preside over the joint meeting of the Third and Fifth Sections, and I hope your work will be very successful.

— Mr. Pellarin then took the Chair.

Presidency of Mr. PELLARIN.

The President (in French). — Gentlemen, we will begin our work without further delay, and our Special Reporter, Mr. Belmonte, will now address the meeting.

Mr. Belmonte, *Special Reporter* (in French). — The question we are going to deal with was covered by a report made jointly by my colleague, Mr. Tosti, and myself, in collaboration with Mr. Delille, Manager of the General Light Railways Company of France.

On starting their work, the Reporters nd themselves faced with two ques-ns. First of all how were « light rail-ys » to be defined ? The reporters ved this point by taking this expression a very wide sense, this being done pur-ely in the questionnaire sent out to railways as shown on page 2 of our ort.

The second question was the meaning be ascribed to the expression « co-ination of operation ». Here again re were many difficulties. The Re-ters drew up a questionnaire corres-ding to their own views on this sub-, then they raised the question whe-r this sufficed as « co-ordination », or ether there were not other ways of ng it.

For co-ordination, the Reporters there-e decided to study co-ordination in the nsport of traffic from a light to a n-line railway and vice-versa. They e considered the relations of the car-s between themselves, and the rela-s between the carriers and their tomers.

For the sake of clearness, we have di-ed up the question into three parts :

1) Layout of installations and con-tions;

2) Operating conditions;

3) Accessory operating conditions.

As regards the *installations* and *con-tions,* the Reporters are of the opinion the light railways should be joined with the main-line railway. Such a nection is often made by common eement; sometimes the railways are ged to do it by law. In most cases, connection is made between the car-s of their own free choice.

As a special case, the Reporters thought dvisable to mention the Italian law, ch obliges light railways to join up with main lines by means of a common station. I must say, however, that the report is not very clear on this point, as the translation fails to give the exact meaning of the Italian law. The latter states that at the maximum only the amount the railway would have had to spend if it built a separate station can be shown in the accounts.

The best results are obtained when the connection takes the form of a common station. Naturally, however, if the two railways, main-line and light, each have their own station, they can be joined up by means of a connecting line. If there is a common station, the joint ownership should extend to all the installations of the main-line station, at least those which can be of use to the light railway, in order to free the latter from unnecessary expense.

If the two railways are of different gauge, the common station is not absolutely necessary. It will, however, be possible if the connection is made by means of a narrow-gauge line running into the main-line station.

The examination of these different points led to the summaries which we will consider at the end of our résumé.

The second part covered the co-ordination of the *operating conditions*. Here again the best solution is a common station, as the main-line railways can easily take the interests and requirements of the light railway into account. This joint ownership will not give rise to any difficulties.

The only difficulty that may have to be overcome is that of the allocation of the common expenditure. This question, however, lies outside the subject we are now discussing. The Reporters dealt with it in a brief study which moreover, is quite interesting.

If the gauge of the two railways is dif-

ferent, the only operation to be done is the transfer of all the traffic, goods and passengers, to the light railway.

According to my own experience, I can affirm that when the two lines are of the same gauge, but have separate stations, it is better to let the light railway run the connecting lines. In this case, the light railway will obtain economies by a better utilisation of its resources. This depends naturally on the condition that the main line railway will be ready to carry out all the necessary operations against payment. This is still fairer when the light railway consists of a great number of lines, and not merely a single line, so that the traffic can travel over various routes.

Even in the case of common stations, the solution considered will not lead to much if it is not completed by combined services. The Reporters have not used the expression « combined services », but « through services ». « Through services » might be confused with international services, so that the expression « combined services » is better in the case of traffic passing from one railway to the other, with only one transport contract, just as if there were a single system.

Generally the law does not oblige the railways to work combined services, but the operating requirements lead the carriers to make agreements to work such services.

In the case of lines of different gauge, when the permanent way is built to different specifications, the service does not include the passage of wagons from one line to the other. In practice, particularly in Italy, what are known as « connecting services » are run. In this case the consignors do not have to apply to the exchange stations, and as far as the public is concerned, the service has the same advantages as combined services.

The Reporters then dealt at some length with two other questions : rating and the routing of transport. In principle they are in favour of letting each line enjoy complete freedom about the rates charged. But, especially on account of road competition, agreements are always possible in the interest of the common good.

As for the routing of transport, the Reporters are not altogether in favour of the established principle that the carrier can transport the goods to destination if he has the necessary means to do so without taking the other railways into account. This derives from English common law, which however has lost its importance. Here, however, we are trespassing on the field of inter-railway competition wherein the question of tariffs, distinctions, and exceptions, are such complicated matters that certain ill-minded persons have been able to call rate making an esoteric science.

In the case of connections, common stations would not be sufficient if it was not possible to run the rolling stock from one system unto the other. When the stock can be freely exchanged the continuation of the traffic is greatly facilitated.

The Reporters mention various ways of exchanging stock, and are in favour of complete trains being run right through, when the gauge is the same, from the light railway over the whole of the main-line system. They are in favour of running complete passenger trains from the light railway over sections of the main-line system, and give a certain amount of information about the organisation to be adopted.

The Reporters then declare themselves in favour of the « container » which is very useful in certain cases. The word

ntainer », they note, has passed into ent railway language. This method eing studied on several railways, re very complete trials have been car- out. The container is mentioned in icular because it assures greater co- nation. There is also another way of ining co-ordination by carrying traf- from one railway to another without er a common station or connecting : the transporter truck.

he third point investigated by the re- ers covers the *accessory operating litions*. This is an important ques- owing to road competition against railway.

ree conditions come under this head- :

Acceleration of combined transport. s requires no comment.

Supplementary services, which in- e : door-to-door services. This is one ne ways in which the motor lorry has advantage over the railway; it can y out complete door-to-door services tself. It is difficult for the railway o so; all that it can do is to speed and increase the collection and deli- services. The main-line railways e already extended such services.

had the opportunity of meeting Mr. er, the Operating Manager of the ss Federal Railways, who showed me interesting volume which makes it that all the stations on the Swiss n-line and light railway systems have ady organised services of this sort. bined door-to-door services are run witzerland. Thus the object of the mmendation formulated in Summary 15 has already been almost comple- realised in Switzerland.

The third of the accessory operat- conditions is the reduction of ex- iture by the elimination of duplicate operations. This is quite natural and requires no comment.

Gentlemen, this brings me to the end of my résumé of the opinions of the Reporters on Question XII. If everyone agrees, we will now go on to the discussion of the summaries.

The President (in French). — Does anyone want any additional explanations about the résumé the Special Reporter has just given us ? If not, we will go on to the summaries at once. (*Agreed.*)

I shall be obliged, therefore, if Mr. Belmonte will read us the summaries. I would like once again to ask the delegates to make their remarks as clearly as possible.

Mr. Belmonte (in French). — *Summary 1 :*

1. In all countries, co-ordination of operation of the main-line and secondary railways is recognised, in principle, as not only useful, but necessary in the general interest.

— *Adopted.*

Summary 2 :

2. It is generally considered as an effective means of meeting the growing competition of other more modern methods of transport.

— *Adopted.*

Mr. Belmonte (in French). — These first two summaries are the outcome of the report as a whole.

We now come to *Summaries 3 and 4*, which relate to the installations :

With particular regard to the *installations :*

3. In the case of two railways of the same gauge, it is preferable to have common junction stations in which the existing equipment of the main-line railway is used to cover the needs of the secondary railway.

— *Adopted without remark.*

Mr. Belmonte (in French). — *Summary 4 :*

4. In the case of railways of different gauges, with separate stations near one another, the narrow-gauge line should run into the main-line railway station, unless transporter trucks are used; in this case it is desirable that the connection should be a standard-gauge line.

I forgot to mention this latter condition in my brief résumé; but it results very obviously from the summary.

The President (in French). — The object of having a standard-gauge line is to avoid transferring the trucks.

Mr. Belmonte (in French). — Naturally.

The President (in French). — The standard-gauge transporter truck carries the wagon right into the main-line station.

— *Summary 4 was adopted without modification.*

Mr. Belmonte (in French). — The following summaries relate to the operation :

As regards *operation :*

5. Both in joint stations and in separate stations connected together, the main-line railway should co-operate to the maximum possible extent, in return for suitable compensation.

— *Adopted.*

Mr. Belmonte (in French). — *Summary 6 :*

6. Through (interchange) traffic should be dealt with under a combined-service system, with a single transport contract (waybill) and joint responsibility of the carriers.

I would like to point out that this system is already in use.

— *Summary 6 was adopted without modification.*

Mr. Belmonte (in French). — *Summary 7 :*

7. When a combined service is impossible or inconvenient, the carriers should make agreements about correspondence services for carrying goods without intervention of the parties concerned at the junctions, fixing according to the best interests of the users the limits of responsibility and competency of each carrier, administratively and legally.

— *Adopted.*

Mr. Belmonte (in French). — *Summary 8 :*

8. It is desirable that the carriers should control their own rates, and on the basis of these rates, each carrier should receive the compensation due for the services actually carried out on his line.

The President (in French). — It is a question of the rates on two adjoining lines. You think the rule should be to weld the rates into a single whole ?

Mr. Belmonte (in French). — Yes, when the gauge is the same. In the case of a small secondary railway, there are generally no differential rates. Then, perhaps, the rates are based on different principles on each of the two systems. In such a case they cannot be welded together.

The President (in French). — Are the amounts added together ?

Mr. Belmonte (in French). — The amounts are added together, or else there is a single rate obtained by adding the mileages.

Mr. Latrasse, *French Nord Railway* (in

ench). — Instead of « compensation » uld we not say « allocation ». It is not compensation.

The President (in French). — Is it not ther « remuneration » ?

Mr. Belmonte (in French). — I agree replacing the word « compensation » « remuneration ».

The President (in French). — Sumary 8 would therefore be slightly altered follows : « ... each carrier should reive the remuneration due for the serces actually carried out on his line ».

— *Agreed.*

Mr. Belmonte (in French). — *Sumary 9 :*

9. It is always better for through transport follow the cheapest route, unless this riously interferes with prompt delivery.

— *Adopted without discussion.*

Mr. Belmonte (in French). — *Sumary 10 :*

10. It is not desirable, in principle, to nforce transit in the case of through traffic, ven when the transit route is the shortest.

I say « in principle » because agreeents are always possible.

For example, if goods have to be conyed from A to B, and between these vo points there is a shorter section C-D, might be demanded that the transport etween C and D be handed over to the condary system in the case of the transrt from A to B. This would mean two anges of carrier. In principle, even if e cost is less, and this is hardly ever e case, it is not desirable, therefore, to ve the right to through (transit) traffic. would be possible to divert some traffic. This principle involves departures from the fixed rule, by agreement between railways.

The President (in French). — Is everyone in agreement about Summary 10 ?

— *Adopted.*

Mr. Belmonte (in French). — *Summary 11 :*

11. When common stock and the indiscriminate use of goods wagons are not considered advantageous, railways of the same gauge, provided safety is not affected, should make agreements for the reciprocal exchange of goods wagons, or at least for running main line vehicles over the secondary railway.

— *Adopted.*

Mr. Belmonte (in French). — *Summary 12 :*

12. In the case of narrow-gauge railways, carriage on transporter trucks or in containers may very effectively prove an adequate corrective of the difference in gauge.

The President (in French). — Transporter trucks are not used to any great extent as yet; there are not many of them in use.

Mr. Belmonte (in French). — In Italy we have begun trials of them on small lines, with encouraging results. They are being introduced, but I cannot give you any exact figures. Such methods are generally used on short secondary lines.

Mr. Gordon *North Western Railway, British India.* — I would like to know what is meant by « transporter trucks » ?

Mr. Belmonte (in French). — They are vehicles of a certain gauge, which can carry wagons and coaches of different gauge, for example, like those used be-

tween France and Spain at Hendaye and Irun. By using these transporter trucks, the French coaches can run on the Spanish broad-gauge lines. This used to be done in the case of passenger coaches, and now it is also done in the case of goods wagons.

Mr. Latrasse (in French). — Tests have been made on the French Nord, but the system proved to be complicated.

Mr. Delille, *Reporter* (in French). — The customers for whom such trucks were ordered soon gave up their transport. The trucks were then used for parcels traffic. This is rather difficult, however. If the trucks are to be used economically, bulk transport to the same destination is necessary. It is better to tranship in the case of parcels traffic.

Mr. Belmonte (in French). — The trucks are suitable for carrying large masses.

The President (in French). — It is sometimes akward to transfer bulk traffic from one system to another.

Mr. Belmonte (in French). — The truck would be useful in the case of parcels traffic when this can be grouped in a large wagon; complete wagon loads are necessary.

Mr. Matter, *Swiss Federal Railways* (in French). — In Switzerland we have used transporter trucks for a long time, with excellent results so far. We do not wish to give up this method, because we have found it satisfactory.

Mr. Latrasse (in French). — In reporting the fact I mentioned just now, I had no intention of requiring the summary to be modified. In view of Mr. Matter's remarks, there is still more reason for agreeing the summary as it stands.

Mr. Belmonte (in French). — The transporter truck is a method that can be very useful.

Mr. Latrasse (in French). — We are prepared to make further trials when these can be made under normal conditions. We had to give up the method because there was no longer any traffic.

The President (in French). — The discussions show that Summary 12 can be adopted as it is. (*Agreed.*)

Mr. Belmonte (in French). — *Summary 13 :*

13. In the case of passenger services, connecting the light railway with important centres on the main-line railway by means of trains continuing over sections of the main-line can be tried with profit.

I might add that, in Italy, we have had several cases of complete trains being transferred from a light to a main-line railway. Formerly the service was limited just to the light railway. But today the new system is much appreciated by the public, the more so as the passenger traffic increases. It is naturally necessary to make an agreement between the two carriers : one of them supplies the motive power, and the other the wagons. The receipts are shared. As a general rule, such services work satisfactorily for all concerned.

The President (in French). — Does everyone agree about Summary 13 ?

— *Adopted without change.*

Mr. Belmonte (in French). — We now come to Summaries 14 to 16 dealing with *ways of fighting competition;* these summaries are preceded by an introductory

aragraph which I will read together with ummary 14 :

As regards *competition*, conjointly with the ore important means investigated by the chnical services to get the best out of o-ordination, the following can be recom-ended :

14. The main-line railway should co-oper-e to the maximum extent in increasing the verage speed of goods in through traffic.

In my opinion, it would be better to ay in summary 14 : « in *combined ser-ices* » instead of « in *through traffic* ».

The President (in French). — I think would be a good thing to group the hree last summaries in one, as No. 14, eading them (*a*), (*b*) and (*c*) respecti-ely.

Mr. Belmonte (in French). — I see no bjection.

The President (in French). — Will the pecial Reporter please read these sum-aaries in their new form.

Mr. Belmonte (in French). — *Sum-ary 14 (former Nos. 14, 15 and 16) :*

As regards *competition*, conjointly with ie more important means investigated by ie technical services to get the best out f co-ordination, the following can be re-ommended :

(*a*) The main-line railway should co-perate to the maximum extent in increasing ie average speed of goods in combined ervices;

(*b*) The greatest possible extension should e given, by both the main-line and second-ry railways, to accessory services making ossible door-to-door transport, using if eed be containers and road vehicles;

(*c*) Whilst safeguarding the autonomous rganisation of each railway, the accountancy ork should be simplified as far as possible and the particular branches of the services should be combined in order to eliminate duplication.

Dr. Baumann, *German Reichsbahn* (in German). — I would like to see a slight change made in the German wording, in paragraph (*a*). I think it would be advisable to replace « im direktem Verkehr » by « im Übergangsverkehr ».

— *Paragraph* (a) *is agreed with the words* « *in combined services* » *instead of* « *in through traffic* ».

Mr. Matter (in French). — As regards point 14 (*b*), I wish to state that in Switzerland we have established door-to-door services at every station, both on the main lines and private secondary railways. Where necessary, we have introduced long-distance cartage services to districts not served by the railway. This supplements the railway services. This system has given very good results, and there is no doubt that it leads to an increase in traffic, as it has been much appreciated by the public. The services are worked by private firms, or individuals. In small stations, they are sometimes covered by the station staff; in such stations there is insufficient work to keep the staff busy all the time, so they can run such services at slack periods. The rates are published, so that the carrier cannot charge arbitrary rates. In certain districts the mail vans are used to collect small consignments of goods as well. There are postal services to all districts at least once a day, whereas the private services are never run more than three times a week.

Perhaps it would in consequence be as well to alter point 14 (*b*) and say : « It would be as well to introduce door-to-door services at every station, wherever needed ».

Mr. Belmonte (in French). — Not only recently, but for a long time I have had the opportunity of studying what has been done in other countries, and I have always admired the perfect organisation of the Swiss door-to-door services. Such an organisation is possible in Switzerland on account of the relatively limited extent of the railway system. Services have always been well organised in Switzerland; it is traditional. Before the railways even, there was an admirable road service in Switzerland, and everyone knows the work of the Swiss road hauliers, who covered the traffic with the southern countries. Switzerland has succeeded in organising door-to-door services at all the stations, owing to the smallness of the country; such a system would not be practicable everywhere. I am wondering therefore if it would not be going too far to say that door-to-door services should be introduced everywhere.

I think that the wording of the summary « The greatest possible extension » fits in very well with Mr. Matter's idea. It does not fix any limit, and implies that it is not forbidden to introduce such services everywhere. I hope Mr. Matter will give up his amendement, therefore, and accept the general idea of the summary, though one or two words in it might be altered perhaps.

We might perhaps say : « Extension to all stations of the main-line railways and of the light railways, of door-to-door transport, and if need be, organisation of road transport in districts not served by rail ».

The President (in French). — Extension to all the stations ?

Mr. Belmonte (in French). — Mr. Matter wants to say instead of « the greatest possible extension », « extension to all the stations ».

Mr. Latrasse (in French). — I like « the greatest possible extension » just as much.

Mr. Belmonte (in French). — It is less imperative.

Mr. Latrasse (in French). — The Swiss organisation could certainly be extended as much as possible. It is perfect. This organisation could easily be realised in view of the smallness of the country, but it is much harder to introduce it on main-line railways serving much larger territories than Switzerland. Moreover, in Switzerland the difficulty of making railways made it impossible for them to penetrate very far. I think the formula « the greatest possible extension » is the best, as it leaves the door open; it is less imperative.

The President (in French). — I suggest we say : « The greatest possible extension of door-to-door transport, even at all stations of both the main-line and secondary railways... »

Mr. Belmonte (in French). — This is the first part of the summary. To include Mr. Matter's idea we might add : « and if need be the organisation of cartage services to places not served by the railway ». All the same this goes rather beyond the idea of co-ordination.

Mr. Delille (in French). — The supplementary services will make door-to-door services possible. It can also be concluded that cartage services are included in the door-to-door services. Supplementary services will always mean door-to-door services, and the idea will be more general.

Mr. Belmonte (in French). — On certain small railways, there may be a very

vy traffic. In organising door-to-door vices one may be going against the in-sts of private firms in the district. s may lead to opposition. But funda-ntally I see no objection to the change.

he President (in French). — How s the proposed text now read ?

Ir. Matter (in French). — My sugges-n is to reword the text as follows :

(*b*) The greatest possible extension door-to-door transport, even at all ions of both the main-line and secon-y railways, and, where required, the anisation of road transport in districts served by rail. »

Ir. Belmonte (in French). — I agree.

he President (in French). — If there no remarks, we will consider this rding of Paragraph (*b*) of Summary as agreed. (*Agreed.*)

This brings us to *Point 14* (*c*) :

(c) Whilst safeguarding the autonomous organisation of each railway, the accountancy work should be simplified as far as possible and the particular branches of the services should be combined in order to eliminate duplication.

— *Adopted without modification.*

The President (in French). — Gentlemen, this brings us to the end of the examination of Question XII.

Before the meeting disperses, I want to congratulate Mr. BELMONTE, the Special Reporter, whose summaries were so ably worded that all the Delegates here present were able to approve of them, so that we were able to complete the discussions on this difficult question extremely quickly.

(*Applause.*)

— The meeting ended at 11 a.m.

DISCUSSION AT THE PLENARY MEETING

held on the 11th June, 1937.

Mr. LE BESNERAIS, Vice-President, in the Chair.

General Secretaries : Messrs. P. GHILAIN, de BOYSSON and CAMBOURNAC.

Assistant General Secretaries : Sir H. Nigel GRESLEY and Dr. Th. KITTEL.

Mr. Ghilain, *General Secretary.* — Gentlemen, we now come to the summaries for Question XII. They were published in No. 6 of the *Daily Journal of the Session.*

— Mr. Ghislain read these summaries.

The President (in French). — Are there any remarks about this text ?

— *No objections were raised.*

The summaries for Question XII will consequently be considered as ratified.

Summaries.

« 1. In all countries, co-ordination of « operation of the main-line and secon- « dary railways is recognised, in prin- « ciple, as not only useful, but necessary « in the general interest.

« 2. It is generally considered as an « effective means of meeting the grow- « ing competition of other more modern « methods of transport.

« With particular regard to the *instal-* « *lations :*

« 3. In the case of two railways of the « same gauge, it is preferable to have « common junction stations in which « the existing equipment of the main- « line railway is used to cover the needs « of the secondary railway.

« 4. In the case of railways of diffe- « rent gauges, with separate stations near « one another, the narrow-gauge line « should run into the main-line rail- « way station, unless transporter trucks « are used; in this case it is desirable « that the connection should be a stan- « dard-gauge line.

« As regards *operation :*

« 5. Both in joint stations and in se- « parate stations connected together, the « main-line railway should co-operate « with the light railway to the maximum « possible extent, in return for suitable « compensation.

« 6. Through (interchange) traffic « should be dealt with under a combined « service system, with a single transport « contract (waybill) and joint responsi- « bility of the carriers.

« 7. When a combined service is im- « possible or inconvenient, the carriers « should make agreements about corres- « pondence services for carrying goods « without intervention of the parties « concerned at the junctions, fixing ac- « cording to the best interest of the users « the limits of responsibility and com- « petency of each carrier, administrative- « ly and legally.

« 8. It is desirable that the carriers « should control their own rates, and « on the basis of these rates each carrier « should receive the remuneration due « for the services actually carried out « on his line.

« 9. It is always better for through transport to follow the cheapest route unless this seriously interferes with prompt delivery.

« 10. It is not desirable, in principle, to enforce transit in the case of through traffic, even when the transit route is the shortest.

« 11. When common stock and the indiscriminate use of goods wagons are not considered advantageous, railways of the same gauge, provided safety is not affected, should make agreements for the reciprocal exchange of goods wagons, or at least for running main-line vehicles over the secondary railway.

« 12. In the case of narrow-gauge railways, carriage on transporter trucks or in containers may very effectively prove an adequate corrective of the difference in gauge.

« 13. In the case of passenger services, connecting the light railway with important centres on the main-line railway, by means of trains continuing over sections of the main-line, can be tried with profit.

« 14. As regards *competition*, conjointly with the more important means investigated by the technical services to get the best out of co-ordination, the following can be recommended :

« (*a*) The main-line railway should co-operate to the maximum extent in increasing the average speed of goods in combined services;

« (*b*) The greatest possible extension of « door to door » transport, even at all stations of both the main-line and secondary railways, and, where required, the organisation of road transport in districts not served by rail;

« (*c*) Whilst safeguarding the autonomous organisation of each railway, the accountancy work should be simplified as far as possible and the particular branches of the services should be combined in order to eliminate duplication. »

[625. 611 & 656. 27]

QUESTION XIII.

Specifications for the fixed plant of railways with light traffic, intended to prevent the use of unnecessarily expensive track equipment, and generally to give economical working.

Preliminary documents.

Report (Great Britain, Dominions and Colonies, America, China, Japan), by Mr. Van Noorbeeck. (See *Bulletin*, November 1936, p. 759, or separate issue No. 7.)

Report (Countries of Continental Europe and their Colonies, Egypt), by A. Svoboda. (See *Bulletin*, March 1937, p. 1235, or separate issue No. 23.)

Special Reporter : A. Svoboda. (See *Bulletin*, June 1937, p. 1601.)

DISCUSSION BY THE SECTION.

Meeting held on June 10th, 1937.

Mr. MELLINI in the Chair.

— The Meeting was opened at 9.30 a.m.

The President (in French). — Gentlemen, I declare this meeting open. This morning, we have to examine Question XIII, the last subject on the agenda. This question is entitled : « Specifications for the fixed plant of railways with light traffic, intended to prevent the use of unnecessarily expensive track equipment, and generally to give economical working. »

As there is a Plenary Meeting of the Congress to-morrow, I must ask you to make your remarks as concise as possible, so that we can finish our work this morning.

I now call upon Mr. Svoboda, the Special Reporter, to give us a brief resumé of the question, as well as the summaries he wishes to submit to the Meeting.

Mr. Svoboda, *Special Reporter* (in French). — Mr. President, Gentlemen, I take leave to state the circumstances relating to the study of Question XIII.

Referring to the report of my colleague, Mr. Van Noorbeeck, and to my two reports (Report No. 2, and special report), I wish to point out that it would have been necessary to give Question XIII a wider interpretation, owing to the close relationship between the saving on plant on the one hand, the suitable operating

hods, and the obligations of the rail- towards the public and the State In- ction Department, on the other.

As regards the expression « railways h light traffic » to begin with, this is ner a vague expression, and we thought dvisable to define the idea more clo- .

At first sight, such an expression would m to refer only to local and colonial lways, seeing that the investigation into estion XIII was entrusted to the Fifth tion.

The information received from the lways consulted and the correspond- e exchanged with some of these Ad- nistrations showed, however, the utility a proper definition of the expression ailways with light traffic ».

We have no intention of refuting some the current ideas on this subject, but have attempted to draw up a more nplete classification of such lines, and have come to the conclusion that, ge- ally speaking, « railways with light ffic » must also include little used in-lines.

The actual investigation into Question II can, in my opinion, be divided into ee parts :

1) Construction and equipment of a e;

2) Maintenance of the installations;

3) Operation of the line.

Before passing judgment on these ele- nts, it must be borne in mind that the e in question, carrying light traffic, is ner part of a large system, or else ms a self-contained unit with no con- tion with other lines.

When building and equipping a new al line, the experience obtained on er railways, as well as the results of nical progress, must be taken into ount.

As regards lines already in existence, the situation is more complex, seeing that the reconstruction and modernisation of lines cannot be achieved at a single step; one has to limit oneself to obtaining an economical service with the existing plant, which is subject to wear, and consequently has to be renewed.

I consider that when it is a question of renewing, the results of the experience of all the railways about improvements to the plant in question should be taken into consideration.

Let us now consider the gauge question.

In the case of railways with connections with the main-lines, there seems to be no doubt about the proper solution. For reasons of expediency, from the technical and operating points of view, the gauge of the line with which the line with light traffic connects up must be taken into account.

In the case of self-contained lines, a wide gauge should also be preferred to a narrow, that is to say the standard gauge should be used, either because of the possibility of using rolling stock with a larger loading surface, or in view of the possibility of using the track materials utilised or standardised for main-lines.

Although the Companies concerned affirm that narrow-gauge secondary lines are completely satisfactory as regards the traffic, in my opinion the fact that the tonnage of the trains is smaller must be taken into account. In addition, from the economic point of view, it must not be forgotten that narrow-gauge lines have to be specially equipped, both as regards the track and the rolling stock.

Moreover, I consider that in the case of local lines which have no connection with other lines, the object for which such lines were built is also a decisive factor in the choice of gauge — except in local circumstances, such as mount-

ainous districts — just as much as the intensity and nature of the traffic expected. In the case of narrow-gauge lines, the metre gauge seems to be preferable to the other narrow gauges.

To make it easier for me to sum up this matter, may I refer you to the synoptic table on page 763/9 of my report. This table shows that out of 36 railways, both in Europe and elsewhere, about 30% are standard gauge, and 52.5 % metre-gauge lines.

As for the gradients and the layout of the line, it cannot be said that small-radius curves are advantageous. The fact proved by experience, that the wear of rails on curves of small radius and on steep gradients is much greater, must consequently be taken into account.

In the following considerations, I shall omit on the one hand all technical details, seeing that certain of the questions raised have been discussed by other Sections at the present Congress, and on the other hand, the principles of technical organisation and the working methods utilised on the main lines, which same principles can also be applied to lines with light traffic.

Gentlemen, allow me to give my motives for what I have just said :

Suppose we ask ourselves the question : What is the ambition of every railway ? I think I am speaking the truth in affirming that the question of the existence of railways is based on endeavours to perfect the lines from the technical point of view, whether it is a question of increasing the running speed, the capacity of the lines, and the useful axle loads, or a question of economical operating.

It must not be forgotten that road and air competition force the railways to increase their running speeds; on the other hand, endeavours to obtain an economical service are the absolute duty of all undertakings.

What may be implied from this résumé ? In my opinion, it is the conclusion that the results of the experience of the main-lines are most valuable, so that not only we might, but we *should* definitely apply them to a certain extent even in the case of lines with light traffic.

For example, if the main-line systems have found that, in the interests of the improvement of the lines and of economical operation, a heavier track is better than a light one, I do not think that it is advisable for lines with light traffic to decide to stick to light track in the future. Some lines with light traffic have proved the value of modernising and perfecting the working methods by introducing such things as telegraphy, and wireless.

As a proof of the close relationship between the experiences of the main-lines on the one hand, and of secondary lines on the other, may I call your attention to the fact that the main-lines, in an endeavour to improve their operating methods, have introduced railcars as a result of the trials made on local lines or railways with light traffic.

It can be stated that a heavy track gives complete satisfaction, by simplifying, facilitating and diminishing the maintenance of the track, and by facilitating the transit of vehicles with heavier axle loads, which makes it possible to avoid transhipping goods at the junctions. The utilisation of the heavy track is advantageous for railways which operate main-lines as well as local lines.

In the case of railways which have no direct connection with other lines as far as the traffic is concerned, as much as possible endeavours should be made to standardise the track. I think it is superfluous to go into the advantages to be obtained by such standardisation.

When a railway with light traffic has
t its importance, owing to the effects
road motor competition, and it would
t be economical to modernise or im-
ove it, taking the local circumstances
o account, the railway should be aban-
ned, and a road service organised in its
ace. This has already been done in the
se of small lines which only joined up
th other lines at a single point.

As regards the economics of the fixed
ant, I think it advisable to mention as
ll the question of sleepers, the main-
ance and renewal of which are relati-
y heavier than that of the rails and
ints and crossings. This refers to woo-
n sleepers. The experience of the main
es goes to show that the use of metal
epers, thanks to the improved methods
fastening the rails to such sleepers,
kes it possible to count on reduced
intenance costs. The life of the slee-
rs should as far as possible equal that
the rails.

To obtain agreement between the oper-
on of signals and points and the train
vements (for example in junction sta-
ns) insulated rails which make it ne-
ssary to use wooden sleepers could be
placed by rail contacts, or else the mo-
rn type of pedals could be used, which
rk with a time lag (retarded excitation
the respective relays).

Amongst the fixed plant which re-
ires periodic renewal may be included
apart from the track — safety equip-
nt, signals, and telephone or telegraph
uipment. During renewal we have to
tain electric current from sources of
all output.

As regards the use of dry batteries, re-
mmended in the summaries to my re-
rt, I am glad to see that the French
lways have applied this system on a
ge scale, with good results (dry batte-
s with air depolarisation).

To attain the object of Question XIII, the choice of such and such equipment or fixed plant must always be based on a comparative estimate of the cost of installation, maintenance and operating.

When all the fixed plant which periodically has to be renewed is taken into consideration, it is found that the cost of installing modern safety equipment at level crossings leads to no savings from the economic point of view, that is to say the railway profits hardly at all from it. Here it is the volume of the road traffic, particularly the road motor traffic, that should be taken into account.

I will quote the following points of view about this question.

On the one hand, the railway should at its own cost build and maintain its lines. On the other hand, the State or other authorities should install, rebuild, improve, and modernise the roads in order to facilitate the development of road motor traffic. It may however be affirmed that the railway is just as important from the point of view of the public good as the roads, although the operation of a railway cannot be modified as quickly as road operation.

In conclusion, it may be said that it would be only fair to regulate this question in such a way that at least the cost of installing safety equipment at level crossings is borne by the public authorities charged with the maintenance of the roadway.

I am sure this problem can be solved.

To facilitate the discussions on Question XIII, I propose to take as a basis the summaries of the reports, which summaries were reproduced in my special report (pages 1603/117 to 1605/119). I am also taking it for granted that all the Delegates here present have made themselves familiar with this report.

Finally, I think I should stress the fact

that my Colleague, Mr. VAN NOORBEECK, has told me that he is in complete agreement with all the summaries of the special report.

The President (in French). — I want to congratulate Mr. Svoboda on the very interesting résumé he has just given us. Has anyone any remarks to make about what the Special Reporter has said ?

Mr. Level, *Compagnie Générale de Voies ferrées d'intérêt local, France* (in French). — I willingly join in the congratulations addressed to the Special Reporter. I think his report should, however, be slightly modified about certain matters.

If I understood Mr. Svoboda's résumé rightly, the sole question being investigated is that of the plant of railways with light traffic, to prevent the use of unnecessarily expensive track equipment and generally to give economical working, so that I am wondering if the question of railcars really comes into it. I do not think that any reference should be made to railcars in this case, because they are not part of the fixed plant.

On the other hand, in his main report, the Special Reporter spoke of certain railway services which could be replaced by road services. This matter was dealt with during the discussions on the question of co-ordination; I think we should not even mention it here.

In the report there is also question in particular of the fencing in of installations, which I do not think we want to go back to. It might even be dangerous to do so.

Mention is made also of stock running at 25 km. (15.5 miles) an hour. I can tell you that speeds of 75 to 80 km. (43 to 50 miles) an hour are obtained with railcars.

I repeat that I think it is definitively dangerous to go into these questions.

Finally in the case of level crossings, it has been said that in most cases they are simply protected. I can tell you that in France the Minister has strongly recommended us to equip all crossings with the St. Andrew's cross as quickly as possible, and this is very expensive. I do not think this is the proper time to speak of this matter.

I am definitively of the opinion that we should limit ourselves to dealing with fixed plant, just this one point, and nothing else.

Mr. Jourdain, *Chemins de fer secondaires du Nord-Est, France* (in French). — I quite agree with what my Colleague, Mr. Level, has just said. I myself want to make a more general remark.

The title of the question was drawn up by the Permanent Commission of the Association, and it runs specifically : « Specifications for the the fixed plant of railways with light traffic, intended to prevent the use of unnecessarily expensive track equipment and generally to give economical working. » The questionnaire that was sent out and the three reports are based on the following three points : analysis of the definition « railways with light traffic »; analysis of the problem properly speaking, which is to find methods likely to give economies as regards the fixed plant, and finally, in the third place, investigation into the most suitable ways of working the said lines. This is not included in the title of the question as formulated by the Permanent Commission, and consequently I think we should stop at the first two points.

Our Section is not specially concerned with railways with light traffic; in a ge-

ral way, it considers light railways, be-
use the expression « railway with light
affic » presupposes that the receipts are
ken into account. We have so-called
ght railways which earn more than
0 000 fr. per kilometre, while there are
nes on the main-line systems, which
ly earn 10 000 fr. per km.

The following question may be asked :
ould all main lines be *a priori* left out
consideration, like we have done ? If
solve it in the same way as the Re-
rters, it is not quite the same as the
estion formulated by the Permanent
mmission.

The President (in French). — Before
king the Special Reporter to answer, I
nt to say this : I do not know if it is
r task to define what are railways with
ght traffic.

I agree with Messrs. Level and Jour-
in that, as the question is enunciated,
should limit ourselves to dealing with
ecifications for the fixed plant of rail-
ys with light traffic, intended to pre-
nt the use of unnecessarily expensive
ck equipment, and generally to give
onomical working. Should our inves-
gations also cover new lines or are we
ly to deal with railways already in
eration ? In the former case, I think
would be useful to have a summary
mething like this : « Before building
railway which is likely to carry only
ght traffic, especially if a narrow gauge
chosen, it should be considered whether
road service would not be better ». For
ample, in Italy, and I believe, in Fran-
in future the building of narrow-
uge railways is not recommended ex-
pt in certain exceptional circumstances,
d only in the case of a system consist-
g entirely of narrow-gauge lines. As
a general rule, I do not think narrow-
gauge lines with light traffic are to be
recommended.

In this way we could come to the question of what should be done in the case of railways with light traffic, already in operation. The Special Reporter has been good enough to enlighten us on all the operating questions, but this question must be summed up in two, three or four summaries at the most. Otherwise our summaries will not apply in general to every country. We must only formulate summaries of a very general nature, acceptable to the majority of States.

Mr. Svoboda (in French). — I would like to say that, in my opinion, there is a misunderstanding about « fixed plant ». Under this heading we should understand all the installations except the rolling stock, i. e., the permanent way, its equipment, the buildings, signals, points and crossings, safety equipment, safety equipment at level crossings, etc.

As for the remarks made by Mr. Level about reduced running speeds in connection with the fencing in of the installations, I want to remark that, in the special report, I quoted in this connection the summaries formulated by my Colleague, Mr. Van Noorbeeck, as a basis for the discussions. On the other hand, in connection with the remark that the question set is limited to « specifications for the fixed plant of railways with light traffic in order to prevent the use of unnecessarily expensive track equipment, and generally to give economical working », I would like to remark that, we have, in agreement with Mr. Van Noorbeeck, analysed all the circumstances relating to the operating. This is extremely

important, in my opinion, in view of the fact that there is a very close relation between the question of the method of working and that of the specifications to which the track is built.

Consequently we analysed the different aspects of the question in order to obtain a wider basis for the discussions; we drew attention to this point in the reports, particularly on page 1602/116 of the special report.

In my opinion, all the factors of the question of fixed plant, the working methods, etc., have been examined.

The President (in French). — Before Mr. Level replies, I want to call your attention to the following point : If we want to agree about the text of the summaries, I am of the opinion that we should seriate the different summaries proposed. I think we should make a distinction between the two parts. For example, there should be a summary about narrow-gauge lines, etc.

On the other hand, we should consider the question of building narrow-gauge railways with light traffic, and the operation of railways who find themselves in a difficult situation, this latter category being the most interesting in my opinion.

If we make such a discrimination, I think we will be able to find a solution very quickly. Otherwise the discussions may drag on, without anything being accomplished. We must draw up definite summaries whose text will be submitted for ratification to the Plenary Meeting tomorrow.

Mr. Level (in French). — I cannot say that I agree with the Special Reporter when he says that he had to go into all the questions affecting the economy. This is going absolutely outside the questior even more than I said just now.

On the other hand, I support what th President has just told us; the summa ries should be arranged in series. Let u start right away, putting on one side a that does not concern the fixed plan

The President (in French). — This gi ves us a definite suggestion, which i to make a discrimination between « plan of railways with light traffic » and « th operation of railways which are in dif ficulties »; in the second case, we wil only examine the fixed plant.

Mr. Jourdain (in French). — I thin we shall have to make our summarie altogether different to those proposed Do you not think it would be advisabl to break off the meeting for an hour s that a special Committee could go int the question and the Meeting could b resumed with a definite text on whic to base the discussions ?

Mr. Fiori, *Italian State Railways* (i French). — Is it understood that the Sec tion agrees to this solution ?

The President (in French). — Doe everyone agree that the Meeting shoul be temporarily suspended, so that a spe cial Committee can draw up a new set o summaries ? *(Agreed.)*

— *The Meeting adjourned at 10.20 a.m and was resumed at 11.15.*

The President (in French). — Gen lemen, the Special Committee has prepar ed some new summaries, which I am going to read to you. These summarie are not very far removed from those sug gested by the Special Reporter, but in ou opinion the new text is more suitable fo the question with which we are now dea ing.

The text is as follows :

. In most countries the general tendency no longer to construct railways for light ffic.

I do not think there will be any oppoion to Summary 1, as the tendency to ild lines for light traffic has been gi- up in nearly every country.

— *Summary 1 was adopted without rerk.*

The President (in French). — Here is *mmary 2* :

. Whenever special circumstances, hower, necessitate the construction of such lways, it is recommended to build them the same gauge as those lines to which y are to be joined, or to the same gauge that of the railway which they are to nplete, and to adopt conditions of lay-out d gradient section which would allow of reduction of traction costs.

Has anyone anything to say about this int ?

— *Adopted without modification.*

The President (in French). — This ings us to *Summary 3*. As you will , the first part dealing with new railys has been completely deleted. The mmary consequently only refers to sting railways with light traffic :

. As far as the railways at present in eration are concerned, it is necessary :

a) To concentrate as much as possible fixed installations of the stations (buildgs, points and crossings) according to the uirements of the traffic, in order to reee to a strict minimum the maintenance ts, train manœuvring times and the necesy staff for the operation of these stations.

b) To take full advantage of experience d technical progress as far as is compatible h the operation of such lines, in order to reduce as much as possible the necessity for specialised staff.

(c) To take advantage of the renewal of installations subject to wear and tear by the use of more appropriate installations, brought about by acquired experience, and modern processes (use of heavier rails, welding of rails, transition curves, etc.) or to complete the equipment of the lines by certain installations which, in accordance with the progress of technical science, also offer better conditions to reach the proposed end.

This is the most important part of the summaries; it is based on those of the Special Reporter, but we have turned them into one single summary.

Has anyone anything to say about this summary ?

Mr. Jourdain (in French). — I think we might change one word : We said in paragraph *(a)* : « According to the requirements of the traffic... ». It would be better to say : « Taking into account the requirements of the traffic... »

The President (in French). — Does the Special Reporter agree to this alteration ?

Mr. Svoboda (in French). — I agree.

The President (in French). — I will read paragraph *(a)* once more, with this alteration :

(a) To concentrate as much as possible the fixed installations of the stations (buildings, points and crossings) taking into account the requirements of the traffic, in order to reduce to a strict minimum the maintenance costs, train manœuvring times, and the necessary staff for the operation of these stations. »

Mr. Svoboda (in French). — I would

like to make another little change in this paragraph. At the end, instead of « the operation of these stations » I would like to say « the operation of the stations ».

The President (in French). — Does everyone agree to this change ?

— *Agreed.*

The President (in French). — Gentlemen, this brings us to the end of the examination of Question XIII. I am ver pleased with the work done by the Spe cial Committee, who succeeded in givin the Section such valuable guidance wit their new summaries in a relatively sho time.

I thank the Members of this Commi tee for their valuable collaboration an the very concise and interesting work w have been able to achieve.

— The Meeting ended at 11.30 a. m.

DISCUSSION AT THE PLENARY MEETING

held on 11th June, 1937.

Mr. LE BESNERAIS, Vice-President, in the Chair.
General Secretaries : Messrs. P. GHILAIN, de BOYSSON and CAMBOURNAC.
Assistant General Secretaries : Sir H. Nigel GRESLEY and Dr. Th. KITTEL.

Mr. Ghilain, *General Secretary*. — We will now examine the Summaries relative to Question XIII, which have been published in Number 8 of the *Daily Journal of the Session*.

— *These summaries were read out.*

The President. — Are there any remarks ?

— *No comments were made.*

We shall consequently consider these summaries as ratified.

Summaries.

« 1. In most countries the general tendency is no longer to construct railways for light traffic.

« 2. Whenever special circumstances, however, necessitate the construction of such railways, it is recommended to build them to the same gauge as those lines to which they are to be joined, or to the same gauge as that of the railway which they are to complete, and to adopt conditions of lay-out and gradient section which would allow of the reduction of traction costs.

« 3. As far as the railways at present in operation are concerned, it is necessary :

« (*a*) To concentrate as much as possible the fixed installations of the stations (buildings, points and crossings) taking into account the requirements of the traffic, in order to reduce to a strict minimum the maintenance costs, train manœuvring times, and the necessary staff for the operation of the stations.

« (*b*) To take full advantage of experience and technical progress as far as is compatible with the operation of such lines, in order to reduce as much as possible the necessity for specialised staff.

« (*c*) To take advantage of the renewal of installations subject to wear and tear by the use of more appropriate installations, brought about by acquired experience, and modern processes (use of heavier rails, welding of rails, transition curves, etc.), or to complete the equipment of the lines by certain installations which, in accordance with the progress of technical science, also offer better conditions to reach the proposed end. »

[625. 14 (01 & 625. 212]

A « circle-nomogram » for the « axle-spacing » formulæ of the Central European Railways Association,

by Alexander FISCHER, Engineer, Prague.

SYNOPSIS.

The final decision of The Central European Railways Association's Technical Committee on a uniform method for the determination of track stresses, is reproduced in this article, a chart with straight reference lines, apt to replace the graph proposed by Engineer Ch. H. J. Driessen (see *Organ für die Fortschritte des Eisenbahnwesens*, 1st April 1937, Part 7), being given.

I. — Introduction.

In a recent publication Mr. Driessen [1] (*) reviews at great length the history, conduct and results of the question now regarded as settled, as to the uniform method for the determination of track stresses for the lines of the Central European Railways Association (V. M. E. V.). The most important result is that the incorporation of a basic figure into the formulæ for calculating track stresses has been abandoned. As a matter of fact, the final decision of the Technical Committee of the V. M. E. V. reads as follows (see [1] p. 120) :

« 1. The Members of the Association are recommended to use the following formulæ for the calculation of track stresses :

(a) For intermediate pairs of wheels :

$$M = \frac{12\,m \cdot n - 7\,(m+n) + 4}{16\,\{3\,m \cdot n - (m+n)\}}\,G \cdot a,$$

$$\sigma_z = \frac{12\,m \cdot n - 7\,(m+n) + 4}{16\,\{3\,m \cdot n - (m+n)\}}\,\frac{G \cdot a}{W}.$$

(*) The figures in square brackets refer to the bibliography at the end of the article.

(b) For end pairs of wheels :

$$M = \frac{12\,n - 7}{16\,(3\,n - 1)}\,G \cdot a,$$

$$\sigma_z = \frac{12\,n - 7}{16\,(3\,n - 1)}\,\frac{G \cdot a}{W}.$$

In the formulæ :

M = bending moment, in kgr./cm.;
= maximum tensile stress, in kgr./cm²;

m and n = ratios of the distances between axles on each side of the load in question to the sleeper spacing;

G = wheel loading (half the axle load), in kgr.;

a = sleeper spacing, in cm.;

W = moment of resistance of the rail section, in cm³.

(c) The values found from *(a)* and *(b)* are to be multiplied by a coefficient of speed

$$k_v = 1 + \frac{v^2}{30\,000}$$

wherein v is the running speed in km. per hour.

2. The following maximum permissible rail stresses are recommended :

(a) In existing track (worn rails) in-

uding allowance for speed, 1 500 to 600 kgr./cm² (21 335 to 22 760 lb. per . in.).

(b) In new track, including allowance r speed, 1 100 kgr./cm² (15 645 lb. per . in.).

3. It is recommended that the maxium sleeper pressure be determined as llows :

If G is the average axle load, in kgr., two adjacent pairs of wheels, d their stance apart in cm., and $n = \frac{d}{a}$, then e maximum sleeper pressure for the hicle in question is $\frac{G}{n}$, in kgr.

This value should be multiplied by the eed coefficient given in 1*c*.

4. The following maximum permissible eeper pressures are recommended :

(a) In existing track, including allowce for speed 13 000 kgr. (28 660 lb.);

(b) In proposed new track, including lowance for speed, 10 000 kgr. 2 050 lb.).

II. — Position of the problem.

For evaluating the factor

$$= \frac{12\,m \cdot n - 7\,(m+n) + 4}{16\,\{3\,m \cdot n - (m+n)\}} \quad . \quad (A)$$

ove, Mr. DRIESSEN gives, in his Table , a nomogram, which is of the so-called grid » type, and he mentions that the rresponding factor in the formula for d pairs of wheels

$$F_e = \frac{12\,n - 7}{16\,(3\,n - 1)} \quad . \quad . \quad (B)$$

n be similarly represented.

The convenient form in which F is pressed, however, enables (A) to be resented in a far simpler and, from the nomogram point of view, altogether more suitable manner, by means of a so-called « circle-nomogram », possessing moreover the advantage of including (B) as well — which is, in fact, derived from (A) for $m = \infty$ (in this connection, see also [1] p. 119.)

III. — Discussion of the « circle-nomogram ».

If we assume that $16\,F_z = f$, we obtain by a simple calculation :

$$3\,m \cdot n\,(f-4) - (m+n)\,(f-7) - 4 = 0,$$

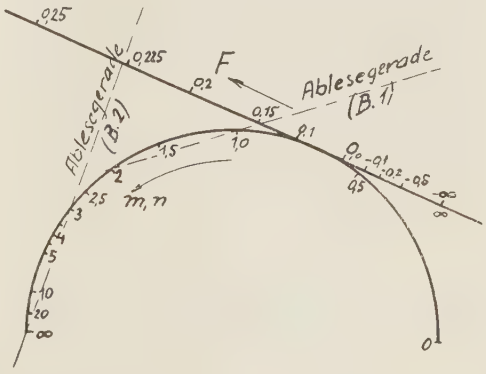
the general form of which is :

$$f_1(x_1)\,f_2(x_2)\,f_3(x_3) + [f_1(x_1) + f_2(x_2)]\,g_3(x_3) + h_3(x_3) = 0.$$

Now such a relationship between the functions of the three variables, x_1, x_2, x_3, can be represented after the well known process, by a chart with straight

$$F = \frac{12\,m \cdot n - 7\,(m+n) + 4}{16\,\{3\,m \cdot n - (m+n)\}}$$

$m = m$: Intermediate pairs of wheels (F_z).
$m = \infty$: End pairs of wheels (F_e).



Key : $m \longrightarrow n \longrightarrow F$.
Examples : 1) $m = 2$, $n = 1$: $F_z = 0.145$.
2) $m = \infty$, $n = 3$: $F_e = 0.226$.

Note : Ablesegerade = Index line.

reference lines in which the variables x_1 and x_2 take the general form of a *conic section* (in particular, also, of a circle), and x_3, that of a reference line or scale, generally curved. The related values of x_1, x_2, and x_3, lie on the same straight « index line ».

The illustration shows a diagram covering *all* values of the variables m, n, and F.

It will be noted that the F-scale is tangent to the circle at the value point corresponding to :

$$m = \frac{2}{3},\ n = \frac{2}{3},\ \mathrm{F} = \frac{1}{16}.$$

If the above value is substituted for m (or n) in (A), then n (or m) is eliminated, i. e. the expression becomes quite independent of n and m, F being in each case $= \frac{1}{16}$, which is also apparent from the diagram.

The point $\mathrm{F} = \frac{1}{3}$ lies at infinity, while negative values of F are compressed into quite a small compass.

It is also apparent that the maximum value of $\mathrm{F}_z = 0.25$, mentioned in [1], is only an « upper limit for F_z », in so far as the variables m and n are limited in the « Table 15 » of [1].

If lower values of m and n are taken, F_z can have any value.

IV. — Use of the nomogram.

The « key » to the illustration makes this quite clear, and the two numerical examples should remove all uncertainty.

V. — Data for the construction.

As the actual construction of the diagram would involve considerable mathematical calculations, the reader is referred instead to the bibliographical notices given below.

The most important are [3], [4], and [5, vol. 1]. My own work in Note III (1928) of [2] should also be referred to. In this connection it should, however, be noted that the assertion made therein (p. 315) that my method gives different « ellipse- and circle-nomograms » from those of R. SOREAU and M. d'OCAGNE is incorrect. (A further derivation of the circle-nomogram in accordance with Note IV (1929) of my work [2] will be given elsewhere).

* * *

Bibliography :

1. Ch. H. J. DRIESSEN : « Die einheitliche Berechnung des Oberbaues im Verein Mitteleuropäischer Eisenbahnverwaltungen ». (The uniform method of determining track stresses, of the Central European Railways Association). *Organ für die Fortschritte des Eisenbahnwesens :* 1937, 1st April, No. 7.

2. A. FISCHER : « Über ein neues allgemeines Verfahren zum Entwerfen von graphischen Rechentafeln (Nomogrammen), insbesondere von Fluchtlinientafeln. (On a new general method for the construction of graphical computation diagrams [nomograms] especially charts with reference lines.) — *Zeitschrift für angw. Math. u. Mech.* »; 1927, Nos. 3 and 5; 1928, No. 4; 1929, No. 5.

3. O. LACMANN : « Die Herstellung gezeichneter Rechentafeln ». (The construction of graphical computation charts.) — Berlin, 1923.

4. M. D'OCAGNE : « Traité de Nomographie » (Treatise on nomography). 2nd edition. — Paris, 1921.

5. R. SOREAU : « Nomographie ou Traité des abaques » (Nomography, or a treatise on calculating diagrams). — Paris, 1921 (2 vols.).

[656. 222.5]

Alinement chart for the determination f the loss of time of passenger trains, due to reduction of speed, on the level,

by R. L. DEVOOGHT,
Engineer, Belgian National Railways Company.

Various circumstances, particularly rmanent-way works, sometimes require at on a section of length L, the speed trains be reduced from the normal va- e V to a lower value v. This speed duction results in a loss of time P, iich is to be calculated.

The total loss of time is composed of ree parts :

(1) Before entering the section in estion, the speed of the train is pro- essively reduced from the value V to e value v. The deceleration produced braking is assumed, on an average, to equal to 50 centimetres per sec. per c., or 1.8 km. per hour per sec. The ne T_1, in seconds, taken to reduce the eed from V to v is consequently ex- essed by :

$$T_1 = \frac{V - v}{1.8}$$

and v being expressed in km./h.

The average speed being $\frac{V+v}{2}$, the stance in metres, covered by the train :

$$L_1 = \frac{V - v}{1.8} \times \frac{V+v}{2 \times 3.6}.$$

e time, in seconds, required to cover this distance at the normal speed V, would have been equal to :

$$t_1 = \frac{L_1 \times 3.6}{V} = \frac{V - v}{1.8} \times \frac{V+v}{2 \times 3.6} \times \frac{3.6}{V}$$

$$t_1 = \frac{(V - v)\ (V + v)}{3.6\ V}$$

$$p_1 = T_1 - t_1 = \frac{V - v}{1.8} - \frac{(V-v)(V+v)}{3.6\ V}$$

$$p_1 = \frac{(V - v)^2}{3.6\ V} \quad . \quad . \quad (1)$$

(2) In the section of length L, upon which a speed restriction is imposed, the speed is v km./h. In order that the results shall not be too precise theoretically, and to allow engine drivers a small margin, more in conformity with actual conditions, the length of the section is increased by 50 m. The times, in seconds, for a train to pass over the section at speeds v and V are respectively :

$$T_2 = \frac{(L + 50)\ 3.6}{v}$$

$$t_2 = \frac{(L + 50)\ 3.6}{V}$$

and

$$p_2 = T_2 - t_2 = 3.6\ (L + 50) \left(\frac{1}{v} - \frac{1}{V}\right) \quad (2)$$

(3) After having passed over the reduced-speed section, the train must revert progressively to speed V, in the time T_3, and on a distance L_3. These terms vary empirically not only with the values V and v, but also with the characteristics of the locomotive and of the load hauled. A typical train, i. e. consisting of a type 10 *(Pacific)* locomotive of the Belgian National Railways Co. and a load of 430 metric tons, has been selected.

The law of variation, with the speed, can be established of the accelerating effort of the locomotive hauling the train in question, and the law of variation, with the speed, of the acceleration of the train running on the level can be deduced from it. The acceleration/speed diagram being established, it is possible, by means of the machine described by Mr. F. CUYPERS in the July, 1936, issue of this *Bulletin*, by progressively increasing the speed of the train from rest, to determine the time and the distance necessary for it to attain this speed. The following is thus obtained :

$$T = \mathcal{T}(V)$$
$$L = \lambda(V)$$

For a value V = v, we have :

$$T = \mathcal{T}(v)$$
$$L = \lambda(v)$$

and when the speed changes from v up to V :

$$T_3 = \mathcal{T}(V) - \mathcal{T}(v)$$
$$L_3 = \lambda(V) - \lambda(v)$$
$$t_3 = \frac{\lambda(V) - \lambda(v)}{V}$$

$$p_3 = T_3 - t_3 = \mathcal{T}(V) - \mathcal{T}(v) - \frac{\lambda(V) - \lambda(v)}{V} \quad . \quad . \quad . \quad . \quad (3)$$

Let us agree that $P_3 = F(V, v)$.

$\mathcal{T}$ and λ are empirical functions of the speed, increasing and diminishing with the speed, and having the same sign as it.

$P_3 = F(V, v)$ varies with V and v in such a way that when v = 0, it has a definitive positive value, and when v = V, it cancels out.

The total loss of time is therefore :

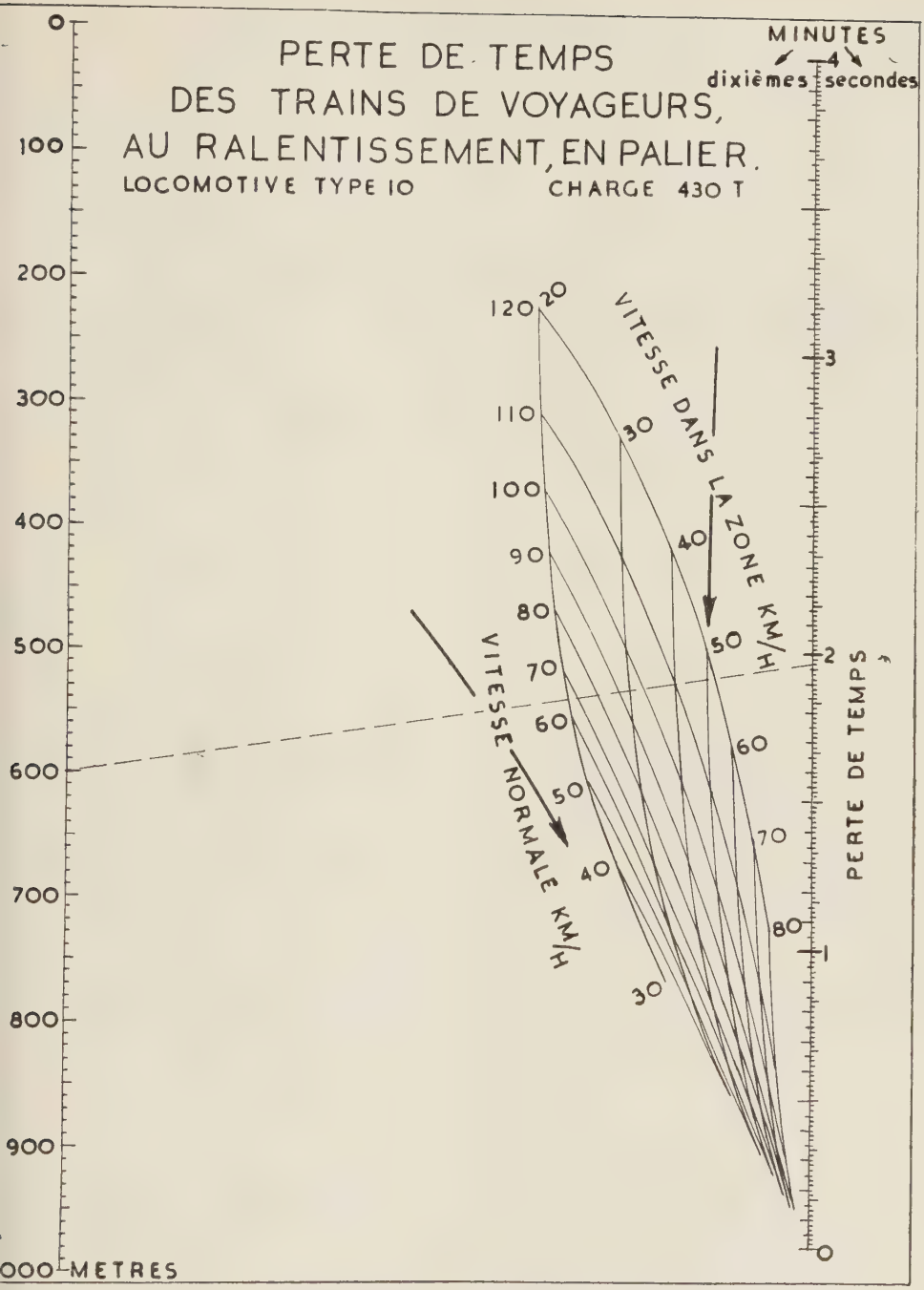
$$P = p_1 + p_2 + p_3$$
$$P = \frac{(V - v)^2}{3.6\,V} + 3.6\,(L + 50)\left(\frac{1}{v} - \frac{1}{V}\right) + F(V, v). \quad . \quad . \quad . \quad . \quad (4$$

We have drawn a nomogram with collinear points (*) giving P directly in relation to L, V and v. (See the figure on page 647.)

The position of the index, drawn in dotted lines, corresponds to the following numerical example :

L = 600 m.; V = 110 km./h.; v = 40 km./h., from which P = 1 min. 58 secs

(*) As is known, a monogram with collinear points, or alinement chart, allows of different curved or straight supports, each graduated in accordance with the value of a variable. The points of these scales, numbered with values which simultaneously satisfy the equation represented by the chart, are found on the same straight line.



Explanation of French terms :

rte de temps... = loss of time of passenger trains due to reduction of speed on the level. Type 10 locomotive. Load 430 metr. tons. — Dixièmes = tenths of a minute. — Longueur de la... = length of the reduced-speed section. — Perte de temps = loss of time. — Vitesse normale, km. h. = normal speed, kilom. per hour. — Vitesse dans la zone... = speed in the reduced-speed section, kilom. per hour.

The equation (4) has 4 variables.

If we agree that

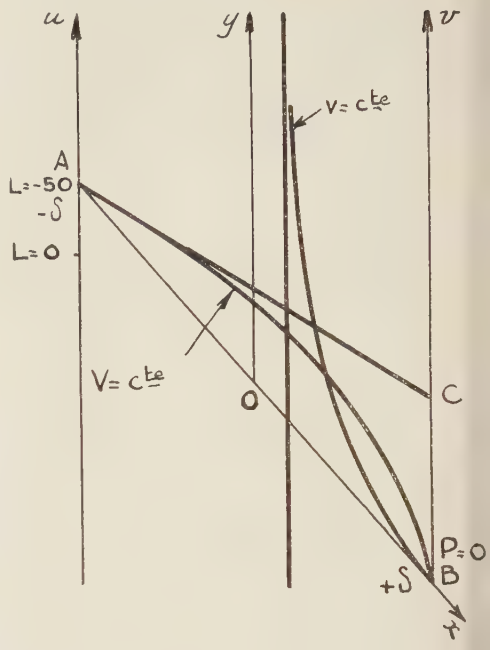
$$z_1 = L$$
$$z_2 = P$$
$$z_3 = V$$
$$z_4 = v$$

and give the same *indices* 1, 2, 3 and 4 to the letters which designate the functions of these variables

$$f_1 = -(L + 50) \quad . \quad . \quad (5)$$
$$f_2 = P \quad . \quad . \quad . \quad . \quad . \quad (6)$$
$$g_{34} = 3.6\left(\frac{1}{v} - \frac{1}{V}\right) \quad . \quad . \quad (7)$$
$$h_{34} = 1 \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$
$$f_{34} = -\frac{(V - v)^2}{3.6\ V} - F\ (V, v) \quad (9)$$

we get

$$f_1 g_{34} + f_2 h_{34} + f_{34} = 0 \quad (10)$$



which is the canonical form of equations which can be represented by an alinement chart with twice-numbered points, made up of a single twice-numbered net and two parallel once-numbered scales. (Maurice d'OCAGNE, *Traité de Nomographie*, 1921 Edition, par. 101, page 294.)

In order to obtain the once-numbered parallel scales, let us agree that :

(L) $u = \mu_1 f_1 = -\mu_1 (L + 50)$. . (11)

(P) $v = \mu_2 f_2 = \mu_2 P$ . . . . . (12)

L in practice remains under 1 000 m.; taking $\mu_1 = 0.25$ mm., the scale L is metric, has a length of 250 mm. (*), and is carried from the top towards the base. The point L = 0 is found at 12.5 mm. below the origin A of the axis u.

P does not normally exceed 4 minutes, i. e. 240 seconds; taking $u_2 = 1$ mm., the scale of P is metric, has a length of 240 mm. (*), and is carried from the base to the top. The point P = 0 coincides with the origin B of the axis v.

The equation of the twice-numbered point (V, v) will be

$$(V, v) \quad u\ \mu_2 g_{34} + v\ \mu_1\ h_{34} + \mu_1\ \mu_2\ f_{34} = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (13)$$

$$u.\ 3.6\left(\frac{1}{v} - \frac{1}{V}\right) + v.\ 0.25 - 0.25\left(\frac{V - v}{3.6\ V}\right)^2 + F\ (V, v) \quad . \quad . \quad . \quad (14)$$

The coefficients of u and of v are of the same sign, the two-figured twice-numbered point will fall, therefore, between the two parallel scales.

It should be noted that the empiricism of the formula (14) lies only in the term F (V, v). A table of numerical or gra-

(*) The illustration has been reduced for convenience in setting up the page.

ical form is, therefore, necessary, of e values of $\mathcal{T}$ (V) and λ (V) for the rious values of (V) whence by the for- ula (3), for the values of F (V, v).

Let us join the origins of the two pa- llel scales by a straight line AB, which will take as the axis of the x'es. Let take the middle 0 of AB $= 2\ \delta$ as the igin, and a parallel to the two parallel ales as the axis of the y'es.

It is proved that

$$x = \delta\ \frac{\mu_1 h_{34} - \mu_2 g_{34}}{\mu_1 h_{34} + \mu_2 g_{34}} \qquad (15)$$

$$y = \frac{-\ \mu_1 \mu_2 f_{34}}{\mu_1 h_{34} + \mu_2 g_{34}} \qquad (16)$$

$$x = \delta\ \frac{0.25\ vV - 3.6\,(V - v)}{0.25\ vV + 3.6\,(V - v)} \qquad (17)$$

$$= \frac{0.25\ v}{3.6} \times \frac{3.6\ F(V, v)\,V + (V - v)^2}{0.25\ vV + 3.6\,(V - v)} \qquad (18)$$

The elimination of v from the two last uations would give the equation of the oup of curves V = constant; the elim- ation of V would give the equation of e group of curves v = constant. This imination is not possible, because of r ignorance of the algebraic form of (V, v).

We will try, however, to form straight- ay an idea of the character of the two stems of curves which constitute the t of twice-numbered points.

Curves of the group V = *constant.*

Let us make v vary from V to 0.

$v = V \qquad x = +\delta \qquad y = 0.$

Then all the curves of this group pass rough the point B.

$< v < V \qquad -\delta < x < +\delta$ y positive

$v = 0 \qquad x = -\delta \qquad y = 0$

The curves also pass through the point A and have their concavity turned towards the base.

We know also the tangent to this point. In fact the point A is numbered L = —50. For this value of L, the loss of time is obtained by joining A to the twice-numbered point (V, v). Now, in proportion as v is nearer to zero, the point (V, v) is nearer to A. When v = 0, the two points coincide and the line passing through a double point is a tangent. This tangent consequently cuts the axis v at a point C corresponding to the value P for L = —50 and v = 0.

The equation (4) gives us

$$v = P = \frac{V}{3.6} + F(V, v)$$

or from (3)

$$BC = v = P = \frac{V}{3.6} + \mathcal{T}(V) - \frac{\lambda(V)}{V}.$$

On the other hand, the determination of the tangent, at B, which cuts the axis of L at a point not at infinity, requires the knowledge of the exact form of the empirical functions $\mathcal{T}$ and λ.

Curves of the group v = *constant.*

Let us make V vary from v to infinity.

$V = v \qquad x = +\delta \qquad y = 0.$

Consequently all the curves of this group pass through the point B.

$v < V < \infty$ y is positive.

$$V = \infty \qquad x = \delta\ \frac{0.25 - \frac{3.6}{v}}{0.25 + \frac{3.6}{v}}$$

$$y = \infty$$

x is positive for $v > 14.4$.

Now, v is always equal to or greater than 20.

Therefore : the curves of the group v = constant pass through B, have their concavity towards the right and rise asymptotically to a vertical straight line always situated nearer the axis of the P's than the axis of the L's.

Of the two groups of curves, we will only draw the spindle-shaped portion limited by the values :

$$V = 30 \qquad V = 120$$
$$v = 20 \qquad v = 80$$

The drawing is made by points, for which two values of L will suffice, (e. g. L = — 50 and L = 950), to calculate P for couples (V, v). The intersection of the two straight lines gives the twice-numbered point (V, v). With v = 0, we shall have with one of the two straight lines, the tangent at A.

The Joosten process of chemical consolidation and sealing of permeable soil,

by Dr. A. KARSTEN.

As a result of the increasing develop-
ent and extension of transport and in-
ıstry during the last ten years, the con-
lidation of sandy and unstable ground
ıd its transformation into a rock-like
ıterial has become very important, es-
cially when undertaking works below
e level of underground water.

Since the development of the so-called
OSTEN process, in which two chemical
lutions are injected into the ground,
ıe after the other, by means of perfor-
ed tubes and pumps, this problem may
nerally be regarded as solved.

The first medium is a solution of sili-
c acid, which, without combining che-
ically with the earthy particles, coats
em with a thin film, at the same time
splacing the underground water, if any.
If the second medium, which is a so-
tion of common salt, is then injected,
e two chemicals immediately combine
form what is known to chemists as a
colloidal gel » of silicic acid.

This instantaneous formation of a ge-
inous substance creates a surface ten-
on the effect of which is to strongly
nd together the earthy particles. The
oduct of this chemical solidification re-
mbles a sandstone, of medium hard-
ss, with a siliceous binding, capable of
sisting the erosive effects of under-
ound water. With a sandy soil the
ushing strength obtained may reach
kgr./cm² (1 140 lb. per sq. in.).

Figure 1 shows the effect of a solution of sodium sulphate (Kleinlogel's formula) on a porous concrete. The immunity of the chemically consolidated concrete is also seen.

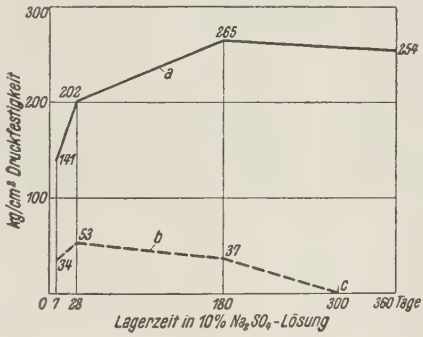


Fig. 1. — Action of sodium sulphate solution on porous concrete.

Note. — *a* = solidified chemically. — *b* = not solidified. — *c* = in a state of desintegration. — Tage = days. — (Ordinates) = crushing strength, kgr./cm². — (Abcissae) = period of immersion in a 10 °/₀ solution of Na^2SO^4.

In solidified soils no loss whatever of the constituent elements, either by washing-out or filtration, can be observed.

There are various possible uses for this process, and it will perhaps be of interest to mention a few which have been put into practice by Siemens-Bau-Union.

Under the increasing loads of lorry traffic the walls of the ancient cathedral of Ribe (Jutland), the foundations of which are composed of dry stones, beca-

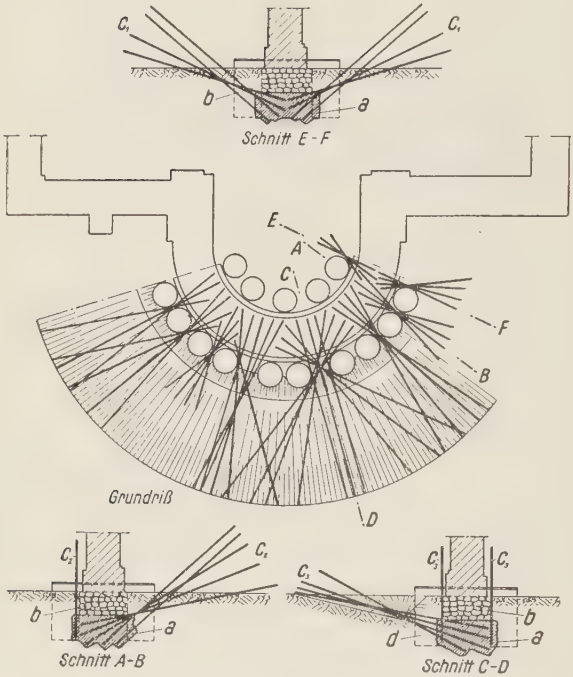


Fig. 2. — Plan and arrangement of injection pipes for the consolidation of the cathedral.

Note. — *a* = Solidification.
b = Original masonry of stones.
c^1 = Arrangements of the injection pipes on both sides.
c^2 = Arrangements of the injection pipes without excavation.
c^3 = Arrangements of the injection pipes in the excavation.
d = Wells sunk.

me so badly cracked that it seemed this historic monument was doomed to destruction.

The original bearing was first extended, by means of the Joosten process, and then carried down to better ground.

Figure 2 shows the plan and arrangement of the injection pipes for the work of consolidation. Tests furnished evidence that the fine quartzy sand was now affording a good bearing and the future stability of the church was assured.

Another case, of railway interest, is that of the consolidation work carried out on the London Underground Railways during the diversion of a main sewer at the Monument Station.

The greater part of the circular section of the new sewer was situated in what is known as « London clay », while the upper part was surrounded by loose gravel. As solidification by means of a grouting process was not giving satisfactory results and the works were situated under a part of the City where the buildings are the most closely packed, and where it was absolutely essential to avoid all disturbance of the subsoil, it was decided to apply the Joosten process, commencing with a trial length of about 5.50 m. (18 ft.). From the last section of the heading, the injection pipes were driven in through the lining and wood shuttering, whereby it was possible to consolidate a bearing point in the loose gravel. The method of consolidation was found to be so satisfactory that it was possible to dispense with stouter supports before driving the tube further in.

A fresh section of the heading was driven under the same conditions, and then timbered in the same way as a tube.

Figure 3 shows a part of the heading already timbered and the arrangements for injecting the chemicals.

The construction of a machinery chamber at the Monument Station was carried out in a similar way, with the co-operation of Messrs. Mowlem, of London, the procedure being the same as that for driving a tunnel. Here the diameter of the excavation was about 7.90 m. (26 ft.) and the radius of the solidified supporting arch about 4 m. (13 ft.) more.

After consolidation, the soil is made watertight, if the layer treated is of sufficient thickness, to the point of complete elimination of water infiltration. During

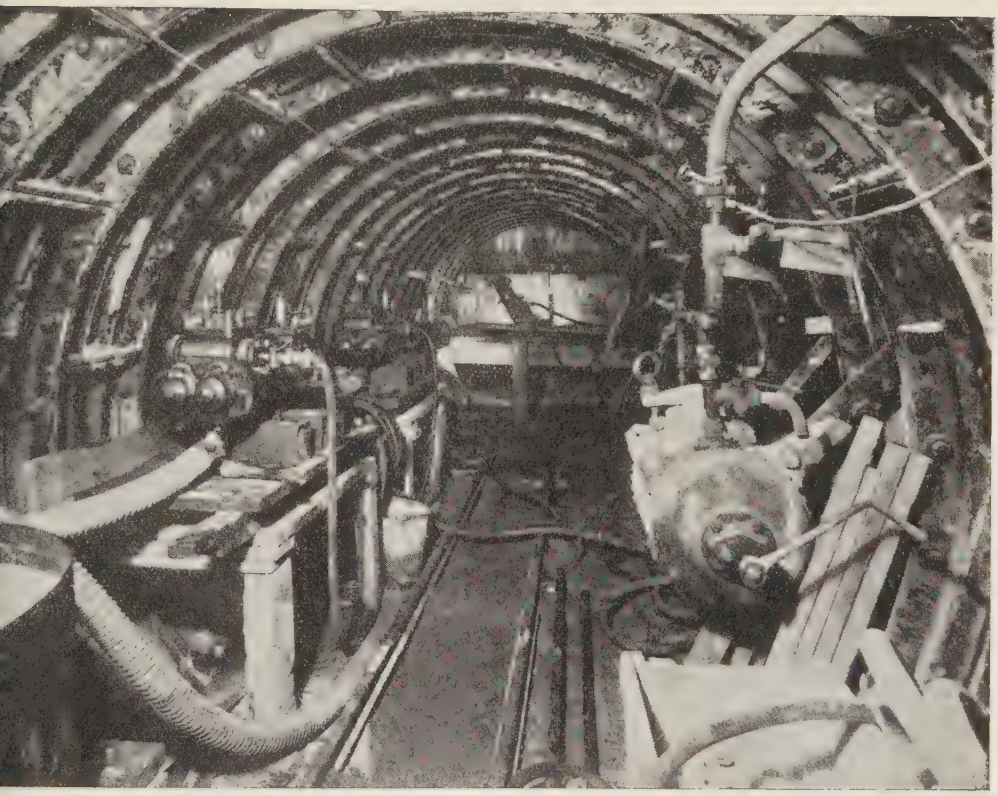


Fig. 3. — Consolidation on the London Underground Railway.
Left, the pressure pumps for injecting the chemicals.
Right, the cone used for forcing grout into piping.

work described above, on the sewer at Monument Station, it was noticed t the ingress of water originating in siliceous strata was reduced to a frac- n of its previous volume, in propor- n as the consolidation proceeded.

The Joosten process may also often be d where holding back water is the ncipal aim, and not the resulting con- dation.

An example is in the construction of a nnel for the elevatory main of a new er distribution system in Düsseldorf. n order to dispense with a catchment basin, it was desired to carry the elevatory main for a length of 500 m. (1 640 ft.), about 4 m. (13 ft.) below the average level of the Rhine.

The lowering of the ground-water level being thought scarcely practicable, the excavation was carried out in a thick footing produced chemically, in which the main was laid.

The degree of impermeability obtained was so complete that it was not necessary to drain more than about 10 litres (2.2 Br. gall.) of water per hour, the outlets remaining open.

The Joosten process is not only suitable for making watertight natural soils and rocks, but it can also be used for restoring the water-tightness of dams, locks, docks and other defective hydraulic works, and in mines.

These interesting examples, of quite recent date, will suffice to show that the Joosten process is playing an increasing part in civil engineering technique. It is not, however, called upon to compet with normal methods, when the latter ar applicable. The chemical method find its scope in modern underground con struction when orthodox methods are in capable of providing a solution to th problem, at least not without exceptiona difficulties. It could, for example, find frequent employment in undergroun railway construction.

NEW BOOKS AND PUBLICATIONS.

385 (02)

lphabetisches Ortsverzeichnis (früher Dr. Koch's Ortsverzeichnis). [*Alphabetical List of Places* (former Dr. Koch's List)]. Twentieth Edition. — Von Barthol & Co. Publishers, Berlin-Wilmersdorf, Prinzregentenstrasse, 53. (Price : 26 Rm.)

This book is published, under the aus-es of the Union of Central European ilway Administrations, by its General ;retary, Mr. M. A. Nether, from in-mation collected from official sources. t must not be mistaken for a similar rk reviewed in this Bulletin, in July 36, which gives a list of railway sta-ns with information about the scope their work. The present volume is a of places giving data relating to their essibility for goods traffic.

The list covers the German Empire, stria, Hungary, Luxemburg, and some ritories now separated from Germany, o the former Austria-Hungary.

t includes all places of any import-ce as regards goods traffic, even if re is no station, as long as they are of erest from the industrial or commer-l point of view. The information gi-about each place includes the station stations belonging to same, or the rest stations (with the distances) and railway system to which these sta-ns belong.

Special signs are used to indicate if the station is open to all kinds of transport, or only to certain traffic.

This list is extremely useful for consignors, who have to show in their waybills the address of the consignee together with the nearest station, and the railway concerned. If the place to which the goods are being sent is not on the railway or if the nearest station is not open for goods traffic, the station through which the goods are to be sent must be indicated. This book enables consignors to find such information, which it is their duty to enter on the waybills.

In the case of a station on a light railway, the list enables the transit station on the main-line railway to be determined, which station has to be shown as the destination station, if there are no through rates, the light railway to carry forward.

This brief review should make it clear that a list like this can be very useful for consignors of goods, as well as indirectly benefiting railway transport, by making it easier to send goods by rail.

E. M.

625. 1 (02)

sners Taschenbuch für den Bautechnischen Eisenbahndienst (*Elsner's Permanent-Way Handbook*), 1938, 16th year. — One volume ($6.\frac{1}{4} \times 4.\frac{1}{4}$ inches) of 494 pages, copiously illustrated. 1938, Berlin, Otto Elsner Verlagsgesellschaft (Price : 2.50 Rm.).

This work constitutes a valuable hand-ok for the German permanent-way en-eer.

t is mainly a collection of plans for laying of points and crossings in use the German State Railways, and the lection has been brought up to date including the latest improvements de in permanent-way material.

ach pair of rails is represented on er by a single line in accordance with the method usual in Germany, and the points and crossings by triangles marking the axes.

The handbook also shows all the details for laying the points and crossings by two lines per pair of rails, and gives the location of the metal sleepers or crossing sleepers.

The sketches, which are clearly dimensioned, relate to turnouts, single or double, with spring or hinged points;

crossings; slip-points; connections; crossing connections; double-curve points for lines curving in the same, or opposite directions; as well as a very extensive series of combinations of points and crossings, which should prove of the greatest use when preparing drawings of layouts. For example, typical diagrams are given for getting out double cross-overs with various arrangements of the six-foot.

The book also includes a well dev loped final chapter on the telephone, pa ticularly the automatic telephones whic are used on the German State Railwa (Bahnselbstanschlussanlage — abbr viated to BASA); the whole is prof sely illustrated, both from the point view of the apparatus used and from th of the wiring diagrams and the gener layout.

J. D.

[**621**. 13 (02 (.43), **621**. 138.5 (02 (.43) & **625**. 26 (02. (.43)]

Elsners Taschenbuch für den Werkstätten und Betriebs-Maschienendienst bei der Deutschen Reichsbahn *(Elsner's Handbook for the locomotive and rolling stock repair shops of the German State Railways).* — One volume (6 1/4" × 4 1/4"), of 670 pages, with numerous figures included in the text. — Otto Elsner Verlagsgesellschaft, Berlin, 1938. (Price : 3.50 RM.).

For the past three years, Messrs. Elsner have published, in the form of a handbook, a collection of the instructions and regulations of the German State Railways with regard to the locomotive department and the rolling stock repair shops. The matter in each annual edition differs completely from that contained in the preceding editions, so that anyone collecting these handbooks will eventually possess a veritable small practical encyclopedia of everything relating to the organisation and working of these branches of the railway service.

The main part of the volume, which has just been issued (third year), is taken up with the whole of the regulations and description of the working methods regarding locomotive boilers, under the headings of : inspection, tests, maintenance and repair of all the parts and accessories of boilers, tool equipment of boiler shops, etc. This occupies almost half the book and enters most minutely into the methods and the plant and tools used by the German State Railways.

The other less important chapters relate to the work to be carried out on rods in the repair shops; the re-use of locomotive parts, as well as the re-use of scrap, of all kinds and categories; the principles underlying the lay-out of locomotive sheds and their allied install tions, such as turntables, traversers, bo ler wash-out plants, appliances for fue ling locomotives and cleaning out th fires of locomotives; installations for r covering the coke and coal contents i ashes, etc.

Another important part of the book devoted to a description of the variou compressed-air brake systems and th instructions for the maintenance of thei parts, viz : — the ordinary or quick-ac ing Knorr or Westinghouse brakes, Kun ze-Knorr brakes, Hildebrand-Knorr br kes, brakes on electric locomotives, etc.

The last chapter deals with the orga isation of the German State Railway finance and accountant's department.

Complete details are also given, in th form of an appendix, regarding the us of tools made of tungsten-carbide stee as well as some data on electrodes fo electric arc welding.

From the enumeration given above, a idea can be gathered of the scope of th matter included in the 1938 edition, as well as of the extent of the particular interesting information that this publi ation places within the reach of enginee in the locomotive and rolling stock d partement.

A. C.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(JANUARY 1938)

16. 385. (02]

I. — BOOKS.

In French.

37 313 .385 (.498)

nuaire statistique des Chemins de fer de l'Etat ain.

carest, Régie autonome des Chemins de fer, Service Statistique générale. 1 volume, 183 pages et carte.

37 313 .385 (.437)

atistique des Chemins de fer tchécoslovaques pour

aha, Ministère des Chemins de fer. 1 volume, 143 et 1 carte.

37 621 .392 & 665 .882

RNANT (E.) et ROSENTHAL (R.).

roduction à l'étude des soudures.

ris, Dunod, 92, rue Bonaparte. 1 volume, 76 pages figures.

In German.

37 621 .392 & 624 .2

RRETT (G.).

er das Verhalten geschweisster Träger bei Dauerspruchung.

rlin, Julius Springer. 1 Band, 21 Seiten und 31 Abngen. (Preis : 3.60 R.M.)

37 62. (01 & 691

F (O.) & WALZ (K.).

rsuche und Erläuterungen zu den Richtlinien für rüfung von Beton auf Wasserundurchlässigkeit.

ttgart-Berlin, Wilhelm Ernst & Sohn. 1 Band, 35 n, 20 Abbildungen. (Preis : 1.20 R.M.)

37 536

H (Wc.).

D. I.-Wasserdampftafeln.

rlin, Hirschwaldsche Buchhandlung, Unter den Lin-60. 1 Band, 64 Seiten und 3 Tafeln. (Preis : 7.50

1937 656 .23 (.43)

MERKERT (E.).

Kernpunkte der Preisbildung im Verkehrswesen.

Berlin, Julius Springer. 1 Band, 76 Seiten. (Preis : 4.80 R.M.)

1937 385

RIEGER (W.).

Konjunkturpolitik der Eisenbahnen.

Stuttgart-Berlin, W. Kohlhammer. 1 Band, 114 Seiten. (Preis : 4.80 R.M.)

1937 656. (.43)

SCHILKEN (E.).

Eisenbahn und Weg.

Würzburg, Konrad Tröltsch. 1 Band, 76 Seiten. (Preis : 3 R.M.)

1936 691

THUM (A.) & OCHS (H.).

Korrosion und Dauerfestigkeit.

Berlin, V. D. I. Verlag. 1 Band, 109 Seiten, 34 Zahlentafeln und 65 Abbildungen. (Preis : 9 R.M.)

In English.

1937 385. (09

ANDREWS (C. B.).

The Railway Age.

London : Country Life Limited, 20, Tavistock street, Covent Garden, W. C. 2. 10 in. × 7 1/2 in., 145 pp. + 82 illustrations on art plates. (Price : 12 s. 6 d. net.)

1937 621 .89 & 662

A. S. T. M. standards on petroleum products and lubricants, prepared by Committee D-2 on Petroleum Products and Lubricants. Published by the American Society for Testing Materials, Philadelphia, Pa. Paper, 6 × 9 in., 390 pp., illustr., diagrams, charts, tables. (Price : $ 2.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress jointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 509).

1937 621 .132.1 (.42)
BARRIE (D. S.)
Modern locomotives of the L. M. S.
Issued with the authority of the London Midland and Scottish Railway by the Locomotive Publishing Co. Ltd., 3, Amen Corner, London, E. C. 4. 8 1/2 in. × 5 1/2 in., 34 pp. + illustration plates. Paper covers. (Price : 1 s. net.)

1937 625 .13
BLACK (A.).
The story of tunnels.
New York and London : McGraw-Hill Book Co., 245 pp. (Price : $ 2.75.)

1937 625 .2 (02 (.73)
Car Builders Cyclopedia of American practice. Compiled and edited for the Association of American Railroads, Mechanical Division.
New York : The Simmons-Boardman Publishing Corporation, 30, Church street. 1 308 pp., 8 1/2 in. by 12 in. (Price : cloth bound, $ 5; leather bound, $ 7.)

1937 385. (02
CAREY (L. A.).
Modern railway practice, facilities and charges.
London : Industrial Transport Publications Limited, Dudley House, Southampton street, W. C. 2. 8 3/4 in. × 5 1/2 in. × 1 in., 176 pp. (Price : 7 s. 6 d. net.)

1937 656 .258
GOLDING (A. J.).
Relay interlocking. (Paper presented to the Institution of Railway Signal Engineers, London, on December 8th.) A pamphlet of 21 pages. (Advance copy.)

1937 38. (09
GOODWIN (A. J. H.).
Communication has been established.
London : Methuen & Co. Ltd., 36, Essex street, W.C. 2. 8 in. × 5 1/4 in. × 1 in., 268 pages. Illustrated. (Price : 10 s. 6 d. net.)

1937 62. (01 & 625 .243
Impact tests of light-weight box cars.
Summary report prepared by the Division of Equipment Research, now the Division of Engineering Research, Association of American Railroads. 59. East Van Buren street, Chicago. 54 pages. (Price : to member roads $ 1; to others $ 2.)

1937 669. (06 (.42)
Institute of Metals Metallurgical abstracts. (General and non-ferrous). Volume 3. Edited by G. Shaw Scott.
London : Offices of the Institute.

1937 669
JONES (W. D.), M. Eng., Ph. D.
Principles of powder metallurgy, with an account of industrial practice. A volume (8 × 5 1/2 inches) of 200 pages, illustrated.
London : Edward Arnold & Co., publishers, 41 and 43, Maddox street, W. 1. (Price : 15 sh. net.)

1937 66
KINZEL (A. B.) and CRAFTS (W.).
Alloys of iron and chromium. Vol. 1, Low-Chron alloys.
New York : McGraw-Hill Book Co. Cloth, 6 × 1 535 pages, illustr., charts, tables. (Price : $ 6.)

1937 625 .14
LEE (Ch. E.).
The evolution of permanent way.
Published by the Permanent Way Institution, don. 64 pages. Illustrated.

1937 621
MATTHEWS (F. J.).
Boiler feed water treatment.
New York : Chemical Publishing Co. Cloth, 5 × 256 pages, illustr., diagrams, charts, tables. (Price :

1937 621
MELLER (K.).
Arc-welding handbook. Translated by J. E. Ginger.
London : Hutchinson's Scientific and Technical blications. (Price : 8 s. 6 d. net.)

1937 625 .2
Railway Carriage and Wagon Handbook.
London : The Locomotive Publishing Co. Ltd., 3, A Corner, E. C. 4. 7 1/2 in. × 5 in., 366 pages. Illustra (Price : 3 s. 6 d. net.)

1937 621 .43
ROSBLOOM (J.).
Diesel handbook. A practical book of instruction Engineers and students on modern Diesel engine Land, marine, locomotive, aero, automobile and port installations. Fourth edition.
London : The Australian Book Company. (Pr 25 s.).

1937 625 .1
STRICK (R.).
Note on reconditioning of curves. Technical p n° 301.
Calcutta : printed for the Railway Board at the Indian Railway Press. 50 pages. (Price : 1 s. or As

---

1937 625 .143.3 (
Third progress report of the joint investigation fissures in **railroad rails.**
Urbana : University of Illinois, Engineering Exp ment Station. Reprint n° 11. 29 pages. Illustra (Price : 15 cents.)

1937
TIMOSHENKO (S.) and YOUNG (D. H.).
Engineering mechanics-dynamics.
New York and London : McGraw-Hill Book Cloth, 6 × 9 in., 323 pages, diagrams, charts, ta (Price : $ 2.75.)

1937
TIMOSHENKO (S.) and YOUNG (D. H.).
Engineering mechanics-statics.
New York and London : McGraw-Hill Book Co. C 6 × 10 in., 334 pages, diagrams, tables. (Price : $ 2.

385 .14 (.54)

I (R. D.).
ay rates in relation to trade and industry in
on : Longmans Green & Co. Ltd., 39, Paternoster
. C. 4; also at Calcutta, Bombay and Madras.
. × 5 1/2 in. × 1 in. 333 pages. (Price : 10 s.
.)

62. (01

OCK (F. V.).
gth of Materials. (Third edition).
on : Sir Isaac Pitman and Sons, Ltd. (Price :
d. net.)

1937 621 .43

WESTBURY (E. T.).
Small internal combustion engines.
London : Percival Marshall and Company, Limited. (Price : 2 s. 6 d. net.)

In Spanish.

1937 625 (.82)

Memoria de la Dirección de Vialidad de la República Argentina.
Buenos Aires, Secretaría de la dicha Dirección. 1 volumen, 867 páginas y figuras.

6. 385. (05]

II. — PERIODICALS.

In French.

nnales des Ponts et Chaussées (Paris).

721 .1

s des ponts et chaussées. juillet. p. 59.
G. — **Equilibre des massifs et calcul des fonda-** (8 300 mots & fig.)

621 .392 (.44) & 624 .62 (.44)

s des ponts et chaussées, juillet, p. 89.
X (P.). — Note sur le **tablier métallique soudé** camp (Oise). (4 500 mots, 2 tableaux & fig.)

Arts et Métiers. (Paris.)

621 .114

t Métiers, octobre, p. 217.
AUBS. — Note sur les **segments de piston.** (4 400 & fig.)

Bulletin de l'Union Internationale des chemins de fer. (Paris.)

385 .113 (.44) & 385 .4 (.44)

le l'Union intern. des ch. de fer, octobre, p. 325.
résultats d'exploitation des Grands Réseaux fran- 1936 et le nouveau régime des chemins de fer. mots.)

385. (09 (.497.2)

le l'Union intern. des ch. de fer, octobre, p. 341.
Chemins de fer de l'Etat bulgare de 1928 à 1935. mots.)

in technique de la Suisse romande. (Vevey.)

62. (01 & 691

echn. de la Suisse romande, n° 23, 6 novembre, 293; n° 24, 20 novembre, p. 307.
IS (A.). — La capacité de résistance du **béton** ans le calcul des profils fléchis. (4 200 mots.)

Bulletin technique trimestriel de l'Union professionnelle des Inspecteurs techniques et des chefs de section des chemins de fer belges. (Bruxelles.)

1937 625 .113

Bull. techn. de l'Union profes. des Inspecteurs techn. et des Chefs de section des ch. de fer belges, 15 octobre, p. 1.
THIBERT (J.). — **Assèchement et drainage des terrains.** (8 000 mots & fig.)

1937 656 .281

Bull. techn. de l'Union profes. des Inspecteurs techn. et des Chefs de section des ch. de fer belges, 15 octobre, p. 25.
MAES (A.). — Quelques **causes de déraillement.** (2 700 mots & fig.)

Chronique des transports. (Paris.)

1937 385 .1 (.494)

Chronique des transports, n° 20, 25 octobre, p. 2.
Les **mesures de rationalisation et d'économies** prises par les Chemins de fer Fédéraux suisses depuis 1920. (4 500 mots.)

1937 385 .113 (.73)

Chronique des transports, n° 20, 25 octobre, p. 8.
Les **chemins de fer des Etats-Unis** en 1936. (1 900 mots.)

1937 385 .4 (.44)

Chronique des transports, n° 21, 10 novembre, p. 2.
Le **nouveau régime des chemins de fer.** Rapport des Compagnies à leurs actionnaires. (4 600 mots.)

1937 385 .113 (.42)

Chronique des transports, n° 21, 10 novembre, p. 9.
Les **chemins de fer de Grande-Bretagne** en 1936. (2 200 mots.)

1937 385 .113 (.494)

Chronique des transports, n° 21, 10 novembre, p. 12.
Les **Chemins de fer fédéraux suisses** en 1936. (2 500 mots.)

Génie civil. (Paris.)

1937 **62.** (01

Génie civil, n° 2880, 23 octobre, p. 349.

JAKOBSEN (A.). — Les **voiles cylindriques de forme elliptique.** (1 000 mots & fig.) (Suite et fin.)

1937 **694**

Génie civil, n° 2880, 23 octobre, p. 356.

Caractères généraux et **essais des bois de service.** (1 600 mots & fig.)

1937 **624** .32 (.47)

Génie civil, n° 2882, 6 novembre, p. 392.

KANDAOUROFF (P.) & POHL (K.). — Les **ponts** de Gorkii et de Saratow sur la Volga (Russie). (3 900 mots & fig.)

1937 **621** .132.3 (.47) & **621** .132.5 (.47)

Génie civil, n° 2883, 13 novembre, p. 405.

IGNATIEV (A.). — Les deux **locomotives soviétiques** figurant à l'Exposition internationale de Paris. (2 400 mots, tableaux & fig.)

1937 **625** .13 (.73)

Génie civil, n° 2884, 20 novembre, p. 432.

Le **tunnel routier** Lincoln, sous l'Hudson, à New-York. (2 400 mots & fig.)

La Technique moderne. (Paris.)

1937 **662.** (06 (.44)

La Technique moderne, n° 21, 1er novembre, p. 723.

Le IIe Congrès mondial du **pétrole.** (7 000 mots.)

1937 **656** .256.3

La Technique moderne, n° 22, 15 novembre, p. 764.

Le **bloc automatique par circuit de voie** à courant pulsé. (1 100 mots & fig.)

Le Container. (Paris.)

1937 **656** .225 & **656** .261

Le Container, octobre, p. 2.

CRESPI. — Le développement du trafic par **containers** pendant l'année 1936. (2 700 mots.)

1937 **656** .225 (.43) & **656** .261 (.43)

Le Container, octobre, p. 7.

WOLFFRAMM (W.). — Le développement des différents **types de petits containers** construits par la Deutsche Reichsbahn. (4 500 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1937 **621** .392 (.493) & **624** .62 (.493)

L'Ossature métallique, novembre, p. 525.

Le **pont** de Haccourt sur le canal Albert. (900 mots & fig.)

Revue générale des chemins de fer. (Paris

1937 **625** .1 (

Revue générale des chemins de fer, novembre, p. 18

NEBOUT. — Note sur le **quadruplement de la Paris-Lyon** entre Villeneuve-La-Guyard et Sens. (mots & fig.)

1937 **656.** (

Revue générale des chemins de fer, novembre, p. 206

Organisation du **Conseil supérieur des transp** (1 400 mots.)

1937 **625**

Revue générale des chemins de fer, novembre, p. 299

MONET. — Chauffage des **autorails** en France. (mots.)

1937 **621** .1

Revue générale des chemins de fer, novembre, p. 301

BAUCELIN. — Un nouvel essai des **huiles de g** sage pour cylindres de locomotives. (900 mots &

1937 **621** .43 & **625**

Revue générale des chemins de fer, novembre, p. 31

Chauffage des **automotrices** et de leurs remor (2 200 mots & fig.)

Revue universelle des Mines. (Liége.)

1937 **626** (.

Revue universelle des mines, novembre, p. 457.

BYLS (A.). — Le **canal Albert.** (4 300 mots & fi

1937 **62**

Revue universelle des mines, novembre, p. 465.

SCHOEMANS (A.) & TASIAUX (P.). — Calcu **poutres** intérieurement hyperstatiques par décom tion de la mise en charge. (3 400 mots & fig.)

Traction nouvelle. (Paris.)

1937 **621** .43 (.5 +

Traction nouvelle, novembre-décembre, p. 190.

LABBE (G.). — Les **autorails** dans les colonies çaises. (4 500 mots & fig.)

1937 **621** .43

Traction nouvelle, novembre-décembre, p. 197.

PEZET (G.). — Résultats d'exploitation par rails en Tunisie. (3 200 mots & fig.)

1937 **621** .43 (

Traction nouvelle, novembre-décembre, p. 206.

ZAKARIAS (A.). — Les **automotrices** des Chemi fer royaux de l'Etat hongrois. (2 500 mots & fig.)

1937

Traction nouvelle, novembre-décembre, p. 217.

BIHOREAU. — Les **carburants** de synthèse da différents pays. (3 900 mots & fig.)

In German.

Die Lokomotive. (Wien.)

621 .132.3 (.51)

komotive, November, S. 197.
-Heissdampflokomotive der Chekiang-Chiansibahn
a. (1 100 Wörter & Abb.)

621 .33 (.47)

komotive, November, S. 208.
Elektrisierung der russischen Eisenbahnen. (1 000
.)

621 .43 (.44)

komotive, November, S. 209.
wagen bei den französischen Eisenbahnen. (2 000
.)

Die Reichsbahn. (Berlin.)

385 .517 (.43)

chsbahn. Heft 42. 20. Oktober. S. 938.
ER. — Zur Neuordnung des **Beamtenunfallfür-**
chts. (5 900 Wörter.)

625 .231 (.43)

chsbahn. Heft 43. 27 Oktober, S. 958.
CK. — Neue **Doppeldeckwagen** der Lübeck-Bü-
Eisenbahn. (1 500 Wörter & Abb.)

656 .222.5 (.43)

chsbahn. Heft 43. 27 Oktober. S. 968.
ER. — Vorrichtung zum Auslegen und Vorfüh-
Fahrplänen, Fahrpreis- und **Entfernungstafeln,**
rten, Anzeigen usw. für **Hand- und elektrischen**
. (2 200 Wörter & Abb.)

Elektrische Bahnen. (Berlin.)

625 .255

che Bahnen, Oktober, S. 236.
W (L.). — Eigenerregte **Wechselstrom-Wider-**
remse. (1 800 Wörter & Abb.)

625 .255

che Bahnen. Oktober. S. 240.
ER (D.). — Regelung der **elektrischen Bremse**
nell-Triebfahrzeugen. (3 500 Wörter & Abb.)

625 .234 (.436)

che Bahnen. Oktober. S. 245.
BUS (J.). — Die **elektrische Zugvorheizanlage**
sbrucker Hauptbahnhof. (2 400 Wörter & Abb.)

Glasers Annalen. (Berlin.)

621 .131

Annalen. Heft 7, 1. Oktober, S. 105.
HER (K.). — **Dampflokomotiven** für hohe
chwindigkeiten. (4 500 Wörter.)

1937 **621 .132.3 (.43)**

Glasers Annalen, Heft 7, 1. Oktober, S. 109.
HEISE (G.). — Der erste **Stromlinien-Dampfzug** der Deutschen Reichsbahn. (1 500 Wörter & Abb.)

1937 **621 .132.5**

Glasers Annalen, Heft 7, 1. Oktober, S. 111.
DOEPPNER (A.). — **Dampflokomotiven** für den Güterschnellverkehr auf Voll- und Schmalspurbahnen. (3 000 Wörter & Abb.)

1937 **621 .43 (.43)**

Glasers Annalen, Heft 7, 1. Oktober, S. 116.
STROEBE. — Entwicklung und künftige Gestaltung der **Verbrennungstriebwagen** der Deutschen Reichsbahn. (6 200 Wörter & Abb.)

1937 **621 .335 (.43)**

Glasers Annalen, Heft 7, 1. Oktober, S. 124.
TETZLAFF (H.). — **Elektrische Triebwagen** für Fahrleitungsbetrieb. (5 300 Wörter & Abb.)

1937 **625 .231 (.43)**

Glasers Annalen. Heft 8, 15. Oktober, S. 133.
THEOBALD. — **Hundert Jahre Doppelstock-Personenwagen** auf deutschen und ausländischen Bahnen. (6 500 Wörter & Abb.)

1937 **621 .33 (.43)**

Glasers Annalen. Heft 9. 1. November, S. 145.
GANZENMÜLLER. — Entwicklung und derzeitiger Stand der **elektrischen Zugförderung** (mit Berücksichtigung des Vierjahresplans). (8 400 Wörter & Abb.)

Organ für die Fortschritte des Eisenbahnwesens. (Berlin.)

1937 **625 .144.2 & 625 .151**

Organ für die Fortschr. des Eisenbahnw., Heft 21. 1. November, S. 385; Heft 22, 15. November, S. 403.
VOGEL (R.). — **Bogenweichen mit Überhöhung** und **Untertiefung.** (9 700 Wörter & Abb.)

1937 **625 .14**

Organ für die Fortschr. des Eisenbahnw., Heft 21, 1. November, S. 390.
DAUNER (W.). — Der Anlaufstoss bei **Eisenbahnfahrzeugen** II. (6 000 Wörter & Abb.)

1937 **621 .132.8 (.43)**

Organ für die Fortschr. des Eisenbahnw., Heft 21, 1. November, S. 400.
MAUCK. — Die dritte 1-B-1 - **Stromlinien-Schnellzugtenderlokomotive** der Lübeck-Büchener Eisenbahn. (1 700 Wörter & Abb.)

Zeitschrift des Vereines deutscher Ingenieure (Berlin.)

1937 **621 .82**

Zeitschr. des Ver. deutsch. Ing., Nr. 43, 23. Oktober, S. 1245.
THUM (A.) & STROHAUER (R.). — Prüfung von **Lagermetallen** und **Lagern** bei dynamischer Beanspruchung. (3 200 Wörter & Abb.)

1937 **621 .333**
Zeitschr. des Ver. deutsch. Ing., Nr. 43, 23. Oktober, S. 1250.

Die neue Entwicklung des **Wechselstrom-Bahnmotors.** (400 Wörter.)

1937 **624 .61 (.43)**
Zeitschr. des Ver. deutsch. Ing., Nr. 44, 30. Oktober, S. 1257.

STANDINGER (F. X.). — Die **Saalebrücke** bei Hirschberg im Zuge der Reichskraftfahrbahn Berlin-München. (4 500 Wörter & Abb.)

1937 **62. (01 & 669**
Zeitsch. des Ver. deutsch. Ing., Nr. 45, 6. November, S. 1305.

VATER (M.). — Das Verhalten **metallischer Werkstoffe** bei Beanspruchung durch Flüssigkeitsschlag. (5 700 Wörter & Abb.)

1937 **621 .135.2 & 625 .212**
Zeitsch. des Ver. deutsch. Ing., Nr. 45, 6. November, S. 1312.

METZ (A.). — **Gewichtsverringerung** von Eisenbahnrädern. (2 200 Wörter & Abb.)

1937 **621 .392**
Zeitsch. des Ver. deutsch. Ing., Nr. 46, 13. November, S. 1326.

Vergleichende Untersuchungen **an Seelen-** und **Mantelelektroden.** (2 800 Wörter.)

1937 **621 .43**
Zeitsch. des Ver. deutsch. Ing., Nr. 46, 13. November, S. 1336.

Einfluss der Luftbewegung auf die Verbrennung im **Dieselmotor.** (700 Wörter.)

Zeitschrift für das gesamte Eisenbahn-Sicherungs- und Fernmeldewesen. (Berlin.)

1937 **656 .253**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 14, 1. November, S. 169.

SCHMITZ (W.). — Die Entwicklung der **Lichttagessignale** seit dem Jahre 1928. (3 400 Wörter & Abb.)

1937 **656 .256**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 14, 1 November, S. 174.

BUDDENBERG (A.). — **Schienenstromschliesser.** (3 500 Wörter & Abb.). (Fortsetzung folgt.)

1937 **656 .257**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 15, 20. November, S. 181.

SCHULTZE. — Das **elektrische Stellwerk** im Winter. (3 000 Wörter & Abb.)

1937 **656 .253**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 15, 20. November, S. 186.

CHAUSSETTE (G.). — Die **Signalisierung** von Ausfahrten. (2 400 Wörter & Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1937 **656 (**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 21. Oktober, S. 749.

MERKERT (E.). — Das **gemeinwirtschaftliche betriebsökonomische Prinzip** im Eisenbahn- und in werblichen Güterfernverkehr. (7 600 Wörter & Abb

---

1937 **385. (09 (**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 21. Oktober, S. 758.

DIECKMANN. — Die **Eisenbahnen in Palä** (1 100 Wörter & Abb.)

1937 **656. (**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 28. Oktober, S. 769; Nr. 44, 4. November, S. 78

MANCE (O.). — **Verkehrswesen** in Deutsch (9 000 Wörter & Abb.)

1937 **656 .2**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 28. Oktober, S. 776.

SCHUBERT (A.). — Mängel **internationaler G** tarife und **Wege** zu ihrer Beseitigung. (1 700 Wö

1937 **621 .33 (.**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 4. November, S. 787.

Die **Elektrisierung** bei den Niederländischen Eise nen. (700 Wörter & Abb.)

1937 **385 .113**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 11. November, S. 803.

Die **Eisenbahnen der Vereinigten Staaten** von rika im Jahre 1936. (7 000 Wörter.)

1937 **625 .6**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr 18. November, S. 823.

SAND (J.). — **Die Kleinbahnen.** (7 000 Wörter.)

In English.

Bulletin, American Railway Engineering Association. (Chicago, Ill.)

1937 **65**
Bulletin, Amer. Ry. Engineer. Assoc., No. 398, Oc p. 65.

Report of Committee XXVI — **Standardization.** words.)

1937 **621 .39**
Bulletin, Amer. Ry. Engineer. Assoc., No. 398, Oc p. 69.

Report of Committee XVIII — **Electricity** (sy of reports of electrical section). (1 600 words.)

7 **656 .25 (.73)**
in, Amer. Ry. Engineer Assoc., No. 398, October, 73.
ort of Committee X — **Signals and interlocking.** words.)

7 **625 .1 (.73) & 69. (.73)**
in, Amer. Ry. Engineer. Assoc., No. 398, October, 77.
ort of Committee VI — **Buildings.** Insulation of ay buildings. Study of improved wearing surface atforms. Design of buildings to withstand earth- shocks. Determination of the destructible value ructures which can be collected in case of fire. ent types of paint and their economical selection; ure record. (9 500 words.)

7 **625 .144.4 (.73)**
in, Amer. Ry. Engineer. Assoc., No. 398, October, 95.
hanized rail laying organizations. (Prepared by Committee 4 — Committee XXII — Economics of ay labor, H. E. Kirby, Chairman, Sub-Committee.) 0 words.)

Electrical Industries. (London.)

7 **621 .332**
rical Industries, No. 1904. November, p. 1302.
FF (J. S.). — **Oil circuit breakers.** (3 000 words .)

Engineer. (London.)

7 **621 .89**
eer. No. 4267, October 22, p. 439 and No. 4268, ctober 29, p. 470.
eral discussion on lubrication and lubricants. words.)

7 **621 .89**
eer. No. 4267, October 22, p. 450; No. 4268, Octo- er 29, p. 479; No. 4269, November 5, p. 508 and o. 4270, November 12, p. 541.
rication and lubricants. (16 200 words.)

7 **621 .43**
eer. No. 4268, October 29, p. 474.
aust gas conditioner. (1 500 words & fig.)

7 **621 .138.2 (.42)**
eer. No. 4268, October 29, p. 483.
ew type locomotive coaling plant. (200 words.)

7 **621 .89**
eer. No. 4269, November 5, p. 496 and No. 4270, ovember 12, p. 526.
eral discussion on lubrication and lubricants. words.)

7 **621 .43 (064 (.42)**
eer. No. 4269, November 5, p. 500.
mercial Motor Transport Exhibition at Earl's (4 500 words & fig.)

1937 **624 .61 & 625 .13**
Engineer, No. 4269, November 5, p. 514.
Centering for masonry bridge. (500 words & fig.)

1937 **621 .4**
Engineer, No. 4270, November 12, p. 538.
LANCHESTER (F. W.). — **The gas engine and after.** (3 500 words.)

1937 **656 .253 (.42)**
Engineer, No. 4270, November 12, p. 546.
Resignalling at Princes-street station, Edinburgh. (500 words & fig.)

1937 **62. (01**
The Metallurgist, p. 65, Supplt. to the Engineer, October 29.
Notched bar testing. (900 words.)

1937 **62. (01 & 669**
The Metallurgist, p. 65, Supplt. to the Engineer, October 29.
MONNYPENNY (J. H. G.). — **Progress in metallurgical microscopy.** (2 400 words.)

1937 **62. (01 & 669 .1**
The Metallurgist, p. 67, Supplt. to the Engineer, October 29.
Hardness of steel at high temperatures. (1 000 words & fig.)

1937 **621 .82**
The Metallurgist, p. 69, Supplt. to the Engineer, October 29.
Light metal bearings. (1 400 words.)

1937 **669 .1**
The Metallurgist, p. 70, Supplt. to the Engineer, October 29.
Scaling of chromium steels. (1 000 words & fig.)

1937 **669**
The Metallurgist, p. 72, Supplt. to the Engineer, October 29.
GREAVES (R. H.). — **Elastic properties of some aluminium alloys.** (1 100 words & fig.)

1937 **669 .1**
The Metallurgist, p. 74, Supplt. to the Engineer, October 29.
Macrostructure and mechanical properties. (900 words.)

1937 **669 .1**
The Metallurgist, p. 75, Supplt. to the Engineer, October 29.
The diffusion of hydrogen through steel. (1 400 words & fig.)

1937 **669 .1**
The Metallurgist, p. 77, Supplt. to the Engineer, October 29.
Iron-manganese-silicon and iron-manganese-sulphur. (1 500 words & fig.)

Engineering. (London.)

1937 **624 .32 (.51)**
Engineering, No. 3745, October 22, p. 448 and No. 3747, November 5, p. 503.
MAO (T. E.). — **The Chien Tang-River road and railway bridge,** South China. (3 200 words & fig.)

1937 **621 .43**
Engineering, No. 3745, October 22, p. 452.
Exhaust-gas conditioner for diesel locomotives. (1 300 words & fig.)

1937 **621 .332**
Engineering, No. 3745, October 22, p. 454.
Pyrotenax fireproof cable. (2 000 words & fig.)

1937 **656 .225 & 656 .26**
Engineering, No. 3745, October 22, p. 458.
Railway container developments. (300 words.)

1937 **621 .89**
Engineering, No. 3745, October 22, p. 461; No. 3746, October 29, p. 476 and No. 3748, November 12, p. 547.
Lubrication and lubricants. (Institution of Mechanical Engineers.) (15 600 words.)

1937 **621 .336**
Engineering, No. 3745, October 22, p. 465.
Induction-type **speedometers for electric trains.** (900 words.)

1937 **621 .43 & 621 .89**
Engineering, No. 3745, October 22, p. 467.
Engine lubrication. (5 500 words.)

1937 **621 .337**
Engineering, No. 3745, October 22, p. 472.
Metadyne system of control for direct-current traction. (900 words & fig.)

1937 **62. (01 & 669**
Engineering, No. 3746, October 29, p. 495.
HERBERT (E. G.). — **A continuous hardness test : periodic hardness fluctuations.** (3 000 words & fig.)

1937 **625 .143.3 & 625 .173**
Engineering, No. 3746, October 29, p. 496.
The **reconditioning of worn rails** by the oxy-acetylene welding process. (700 words.)

1937 **621 .89**
Engineering, No. 3746, October 29, p. 500.
Industrial applications of lubrication. (400 words.)

1937 **621 .43 (064 (.42)**
Engineering, No. 3747, November 5, p. 507.
Commercial Motor Transport Exhibition at Earl's Court. (700 words & fig.)

1937 **388. (.42)**
Engineering, No. 3747, November 5, p. 518.
Developments in London Passenger Transport. (1 600 words.)

1937 **656 .253 (.4**
Engineering, No. 3747, November 5, p. 524.
Resignalling of Princes Street Station, Edinbur
(500 words.)

1937 **62. (01 & 669**
Engineering, No. 3747, November 5, p. 526.
SILLIFANT (R. R.). — Recent experiments in c
nection with the **spraying of steel.** (2 700 words & fi

1937 **656. (064 (.4**
Engineering, No. 3748, November 12, p. 533.
The Public Works, Roads and Transport Exhibiti
(7 800 words & fig.)

1937 **62. (**
Engineering, No. 3748, November 12, p. 537.
Notched-bar impact testing. (3 100 words.)

1937 **621**
Engineering, No. 3748, November 12, p. 546.
The gas engine and after. (1 300 words.)

1937 **621**
Engineering, No. 3748, November 12, p. 553.
The properties and testing of lubricants. (4
words.)

1937 **625 .234 & 6**
Engineering, No. 3748, November 12, p. 556.
FABER (O.). — **Air-conditioning.** (6 500 words
fig.)

Engineering News-Record. (New York.)

1937 **624. (.**
Engineering News-Record, No. 16, October 14, p.
KRANZ (H. H.). — **Rigid frame with Vierend**
bracing (McMillan St. bridge in Cincinnati). (1
words & fig.)

1937 **691 & 6**
Engineering News-Record, No. 16, October 14, p.
GILKEY (H. J.). — **The moist curing of concr**
(2 500 words & fig.)

1937 **721 .9 (.**
Engineering News-Record, No. 16, October 14, p.
DOW (A. L.). — **Foundation exploration in d**
water. (3 800 words & fig.)

1937 **721 .1 (.**
Engineering News-Record, No. 19, November 4, p.
Sinking caissons in Debris fill. (5 600 words & f

1937 **725 .33 (.**
Engineering News-Record, No. 19, November 4, p.
DEWELL (H. D.). — **Elevated concrete tanks**
record size. (3 200 words & fig.)

1937 **691 & 6**
Engineering News-Record, No. 20, November 11, p.
MacBRIDE (D. S.). — **Balancing costs in winter**
creting. (2 000 words & tables.)

rnal, Institute of Transport. (London.)

38 & 62

Institute of Transport, No. 1, November, p. 7.
(Sir A.). — **Engineering limitations and trans-als.** (4 000 words.)

---

656 .223.2 (.82)

Institute of Transport, No. 1, November, p. 12.
ASANT (H. E.). — **Wagon utilisation.** (13 000

38

Institute of Transport, No. 1, November, p. 23.
COX (L. K.). — **Things to come in transport.** ords.)

---

ournal, Institution of Civil Engineers. (London.)

624 & 72

Institution of Civil Engineers, No. 8, October, 97.
ER (J. F.). — **Modern methods of structural** (8 200 words & fig.)

---

625 .13 (.54)

Institution of Civil Engineers, No. 8, October, 25.
VEY (B. L.). — **The restoration of the breach** right guide bank of the Hardinge bridge. (4 500

---

624 .67

Institution of Civil Engineers, No. 8, October, 65.
DMAN (F. W. A.). — **The lower Zambezi bridge.**
RTH (G. E.). — **The construction of the lower** i **bridge.** (6 300 words.)

---

624 .2

Institution of Civil Engineers, No. 8, October, 02.
OLS (H. J.). — **Pre-stressing bridge girders.** ords & fig.)

---

691 & 693

Institution of Civil Engineers, No. 8, October, 40.
VART (D. A.). — **Fundamental research on the ion of vibration to the pre-casting of concrete.** ords.)

---

62. (01 & 621 .392

Institution of Civil Engineers, No. 8, October, 01.
Y (S. F.). — **Welded joints in pressure-vessels.** ords & fig.)

---

62. (01 & 669 .1

Institution of Civil Engineers, No. 8, October, 49.
IELDS (Sir R. A.) and MAIN (S. A.). — **Cor-f iron and steel.** (4 300 words & fig.)

Journal, Permanent Way Institution. (London.)

1937 **621 .392 & 625 .143.4**

Journal, Permanent Way Institution, August, p. 189.
SOMERVILLE (T. J.). — **Welded rail joints.** (6 000 words & fig.)

1937 **625 .151 (.42)**

Journal, Permanent Way Institution, August, p. 216.
ALLEY (D. S.). — **Switches and crossings** of the British standard section. (2 900 words & fig.)

1937 **625 .173 (.42)**

Journal, Permanent Way Institution, August, p. 227.
KEAR (O.). — **Relaying-preparation work of a length** & relaying ganger. (4 300 words.)

1937 **621 .17 & 665 .882**

Journal, Permanent Way Institution, August, p. 238.
DORÉ (R. E.). — **The application of oxy-acetylene welding to track work.** (6 000 words & fig.)

Mechanical Engineering. (New York.)

1937 **665 .882**

Mechanical Engineering, No. 11, November, p. 805.
OBERT (C. W.). — **Recent developments in fusion welding.** (2 900 words & fig.)

1937 **62. (01 & 665 .882**

Mechanical Engineering, No. 11, November, p. 809.
ISENBURGER (H. R.). — **Radiographic inspection,** its application to joint in field-welded pressure piping. (2 800 words & fig.)

1937 **62. (01**

Mechanical Engineering, No. 11, November, p. 813.
ABBOTT (E. J.) and GOLDSCHMIDT (E.). — Surface quality. (7 000 words & fig.)

1937 **62. (01**

Mechanical Engineering, No. 11, November, p. 826.
WAY (S.). — Surface finish. (1 900 words & fig.)

1937 **621 .133.1 & 662**

Mechanical Engineering, No. 11, November, p. 829.
SHERMAN (R. A.). — **Status of our knowledge of coal selection for steam-generating equipment.** (6 300 words & fig.)

1937 **016**

Mechanical Engineering, No. 11, November, p. 845.
DEXTER (G. M.). — **The library as an engineering tool.** (5 600 words & fig.)

1937 **669 .1**

Mechanical Engineering, No. 11, November, p. 858.
Flame hardening (oxy-acetylene tips). (400 words.

1937 **621 .43 (.4)**

Mechanical Engineering, No. 11, November, p. 858.
European automotive Diesels. (600 words & fig.)

1937 **625** .212 (.73)
Mechanical Engineering, No. 11, November, p. 859.
Improved chilled car wheels. (600 words.)

Modern Transport. (London.)

1937 **656** .42
Modern Transport, No. 971, October 23, p. 3.
Transport co-ordination. (2 300 words.)

1937 **656** (.44)
Modern Transport, No. 971, October 23, p. 5.
WYMER (F. J.). — **Transport facilities in France.** (1 800 words.)

1937 **621** .43 (.89)
Modern Transport, No. 971, October 23, p. 6.
Diesel-engined railcars for Uruguay. (1 500 words & fig.)

1937 **656** .253 (.42)
Modern Transport, No. 971, October 23, p. 7.
Re-signalling at Edinburgh. (500 words.)

1937 **656** .1 (.42)
Modern Transport, No. 972, October 30, p. 3.
KENILWORTH (Lord). — **Present position of motor transport.** (1 700 words.)

1937 **725** .12 (.42)
Modern Transport, No. 972, October 30, p. 4.
ROBINSON (A. T. V.). — **Work of the Ministry of Transport.** (1 900 words.)

1937 **656** .1 (.42)
Modern Transport, No. 972, October 30, p. 5.
WINDSON (W. A.). — **Burdens on road transport.** (1 700 words.)

1937 **621** .43
Modern Transport, No. 972, October 30, p. 6.
ALCOCK (J.). — **Exhaust gas conditioner for diesel locomotives.** (1 700 words & fig.)

1937 **656** .1 (.42)
Modern Transport, No. 972, October 30, p. 7; No. 973, November 6, p. 6 and No. 974, November 13, p. 6.
DUNBAR (Ch. S.). — **Organisation of parcels carrying by road.** (8 500 words.)

1937 **656** .1 (.42) & **656** .261 (.42)
Modern Transport, No. 972, October 30, p. 9.
WOOD (Sir W. W.). — **Railway companies as road users.** (2 500 words.)

1937 **656** (.42)
Modern Transport, No. 972, October 30, p. 10.
Railways and roads. (1 000 words.)

1937 **656** .222.1 (.42)
Modern Transport, No. 972, October 30, p. 11.
Accelerations on L. M. S. Midland line. (1 000 words.)

1937 **388.**
Modern Transport, No. 973, November 6, p. 9.
THOMAS (T. E.). — **Road passenger transpo greater London.** (3 800 words & fig.)

1937 **621**
Modern Transport, No. 973, November 6, p. 12.
WEBBER (A. F.). — **Locomotive design and struction.** (1 900 words.)

1937 **656** .234
Modern Transport, No. 973, November 6, p. 13.
Economics of workmen's fares. (2 500 words.)

1937 **388.**
Modern Transport, No. 973, November 6, p. 17.
London Passenger Transport Board's record (4 000 words & fig.)

1937 **656** .225
Modern Transport, No. 973, November 6, p. 23.
Road-rail trailer development. (1 300 words & f

1937 **656** .261
Modern Transport, No. 973, November 6, p. 43.
JONES (W. G.). — **Railway-operated road tran** (2 300 words & fig.)

1937 **656** .2
Modern Transport, No. 974, November 13, p. 9.
BARRINGTON-WARD (V. M.). — **Railway o ing.** (2 200 words.)

1937 **656** .261
Modern Transport, No. 974, November 13, p. 11.
Vehicles for railway requirements. (1 500 wo fig.)

1937 **656** .261
Modern Transport, No. 974, November 13, p. 21.
FAIRCLOTH (H. W.). — **Progress in railway ca** (1 600 words & tables.)

1937 **656.**
Modern Transport, No. 974, November 13, p. 27.
GUPWELL (L. W.). — **Co-ordination of goods port.** (2 090 words.)

1937 **656** .261
Modern Transport, No. 974, November 13, p. 29.
WILSON (A. R.). — **Railway requirements i transport.** (1 500 words.)

Proceedings, American Society of Civi Engineers. (New York.)

1937 **624**
Proc., Amer. Soc. Civil Eng., No. 8, October, p.
ANDERSEN (P.). — **Design in reinforced conc torsion.** (1 900 words & fig.)

7 **721 .1**
Amer. Soc. Civil Eng., No. 8, October, p. 1621.
CHEBOTAREFF (G. P.) and HRENNIKOFF (A.). **ressures beneath a spread foundation.** (4 400 .)

---

7 **725 .33**
Amer. Soc. Civil Eng., No. 8, October, p. 1648.
CH (H. N.), STONE (M. A.) and BOARDMAN .). — **Earthquake resistance of elevated water-** (2 200 words & fig.)

Railway Age. (New York.)

7 **621 .138.5**
ay Age, No. 15, October 9, p. 483.
CKEN (J. R.). — **Economic life of locomotives.** nued case study of the shop-repair costs of loco-es from the eighteenth to the twenty-fifth years e. (1 200 words & fig.)

---

7 **624. (.73) & 625 .13 (.73)**
ay Age, No. 15, October 9, p. 485.
sand boxes to place long, heavy spans. (2 300 & fig.)

---

7 **625 .11 (.73) & 625 .122 (.73)**
ay Age, No. 16, October 16, p. 519.
ESTON (G.). — **Mt. Shasta « mud » flows re-line change on S. P.** (1 800 words & fig.)

---

7 **625 .24 (.73) & 656 .225 (.73)**
ay Age, No. 16, October 16, p. 522.
NIS (W. L.). — **Car men's responsibility for t loss and damage.** (3 300 words.)

---

7 **385 .31 (.73)**
ay Age, No. 16, October 16, p. 527.
Hands off Interstate Commerce Commission » — ngill. (3 800 words.)

---

7 **621 .133**
ay Age, No. 16, October 16, p. 531.
TLEY (H. B.). — **Superheat versus steam pres-** (2 200 words & fig.)

---

7 **654. (06 (.73)**
ay Age, No. 16, October 16, p. 535.
egraph and Telephone Convention. (2 000 words.)

---

7 **621 .139 (.73), 625 .18 (.73) & 625 .27 (.73)**
ay Age, No. 17, October 23, p. 555 and No. 18, ctober 30, p. 606.
ge scrap plant opened on New York Central. (6 000 & fig.)

---

7 **625 .234**
ay Age, No. 17, October 23, p. 562.
gess air-delivery system tested. (2 100 words &

1937 **624 (.73)**
Railway Age, No. 17, October 23, p. 565.
Erecting longest railroad girder. (1 800 words & fig.)

1937 **313 : 656 .28 (.73)**
Railway Age, No. 17, October 23, p. 567.
Accidents in 1936. (1 600 words.)

1937 **614 .8 (.73)**
Railway Age, No. 17, October 23, p. 569.
Safety as a railway problem. (4 800 words.)

1937 **656 .1 (.43) & 656 .2 (.43)**
Railway Age, No. 17, October 23, p. 579.
German expert explains **truck-rail co-ordination.** (1 800 words.)

1937 **621 .43 (.73)**
Railway Age, No. 17, October 23, p. 581.
Auto-railer locomotive. (200 words & fig.)

1937 **625 .242 (.73) & 625 .246 (.73)**
Railway Age, No. 18, October 30, p. 599.
Ore Car weights 16 per cent less than previous design. (1 200 words & fig.)

1937 **625 .1 (06 (.73)**
Railway Age, No. 18, october 30, p. 613 and No. 19, November 6, p. 639.
Bridge and Building men hold busy meeting. (Subjects discussed : protecting bridges and buildings against fire; organizing to meet demands of the present day; the insulation of railway buildings; etc.) (10 700 words.)

1937 **621 .43**
Railway Age, No. 19, November 6, p. 636.
The Diesel in railroad service. (4 100 words.)

1937 **385. (061.4**
Railway Age, No. 19, November 6, p. 639.
A. A. R. adopts Association of Railway Electrical Engineer. (6 000 words.)

1937 **624 .7 (.73)**
Railway Age, No. 20, November 13, p. 674.
BATES (F. E.). — **Novel concrete towers support steel girders.** (1 300 words & fig.)

1937 **625 .244 (.73)**
Railway Age, No. 20, November 13, p. 676.
Refrigerator for L. C. L. perishables. (200 words & fig.)

1937 **621 .132.8 (.73)**
Railway Age, No. 20, November 13, p. 677.
Turbine locomotive design proposed. (2 500 words.)

1937 **614 .8 (.73)**
Railway Age, No. 20, November 13, p. 679.
Fire Association meets at Cleveland. (2 600 words.)

1937 **385. (061.4)**
Railway Age, No. 20, November 13, p. 681.
Two electrical sections hold joint meeting. All association work in mechanical and engineering departments, now within province of A. A. R. (5 400 words.)

1937 **385 .15 (.73)**
Railway Age, No. 20, November 13, p. 686.
Government ownership attached. (2 600 words.)

Railway Engineering and Maintenance. (Chicago.)

1937 **625 .14 (.73)**
Railway Engineering and Maintenance, November, p. 794.
CLARKE (H. S.). — **Building for today's traffic.** What one Railroad has done to strengthen its organization and improve its track structure. (3 800 words & fig.)

1937 **625 .143 (.73)**
Railway Engineering and Maintenance, November, p. 798.
REECE (A. N.). — **Kansas City Southern lays 78-ft. rail.** (2 100 words & fig.)

1937 **625 .143.3 (.73)**
Railway Engineering and Maintenance, November, p. 800.
BRONSON (C. B.). — **Causes of fillet cracks.** (600 words.)

1937 **625 .1 (06 (.73)**
Railway Engineering and Maintenance, November, p. 801.
Bridge & Building men meet in Chicago. (Papers discussed : Accidents, deferred maintenance painting, organization rebuilding, trestle evolution, building insulation, movable bridge maintenance, protection against fires, water service rehabilitation, etc.) (57 000 words & fig.)

Railway Gazette. (London.)

1937 **621 .33 (.42)**
Railway Gazette, No. 17, October 22, p. 689.
The work of the British Electrical Federation. (2 300 words.)

1937 **624 .7 (.489)**
Railway Gazette, No. 17, October 22, p. 691.
The Storstrom bridge. (1 900 words & fig.)

1937 **621 .133.3**
Railway Gazette, No. 18, October 29, p. 718.
Locomotive boiler proportions. (900 words.)

1937 **621 .133.3**
Railway Gazette, No. 18, October, p. 724.
POULTNEY (E. C.). — **The firebox proportions of modern locomotive boilers.** (4 000 words & fig.)

1937 **656 .257 (.**
Railway Gazette, No. 18, October 29, p. 729.
Signalling concentration at Johnston Station, G
Western Railway. (900 words & fig.)

1937 **621 .332 (.**
Railway Gazette, No. 18, October 29, p. 732.
Pyrotenax cables. (1 000 words & fig.)

1937 **656 .254 (.4**
Railway Gazette, No. 18, October 29, p. 733.
Short wave wireless equipment on Norwegian go
trains. (200 words & fig.)

1937 **621 .132.3 (.**
Railway Gazette, No. 18, October 29, p. 734.
New semi-streamlined locomotives, Canadian P
fic Railway. (400 words & fig.)

1937 **621 .9 (.**
Railway Gazette, No. 18, October 29, p. 736.
A new duplex boring and turning mill. (800 word
fig.).

1937 **625 .151 (.**
Railway Gazette, No. 18, October 29, p. 737.
New point lever. (200 words & fig.)

1937 **621 .**
Railway Gazette, No. 19, November 5, p. 773.
Locomotive boiler proportions. (1 000 words.)

1937 **625 .13 (.**
Railway Gazette, No. 19, November 5, p. 779.
Reconstruction of superstructure of wood green
over bridge L. N. E. R. (900 words & fig.)

1937 **624 (.73) & 625 .13 (.**
Railway Gazette, No. 19, November 5, p. 782.
Unusual method of erecting heavy girders. (500 wo
& fig.)

1937 **625 .4 (.4**
Railway Gazette, No. 19, November 5, p. 783.
CONSTAM (E. G.). — The Santis aerial ropew
(2 000 words & fig.)

1937 **725 .35 (.**
Railway Gazette, No. 19, November 5, p. 787.
Reinforced concrete timber shed at Speke, L. M. S
(600 words & fig.)

1937 **621 .132.4 (.**
Railway Gazette, No. 19, November 5, p. 789.
New locomotives for Peru. (500 words & fig.)

1937 **621 .138.5 (.4**
Railway Gazette, No. 19, November 5, p. 790.
Gauging and machining axleboxes. (1 100 words
fig.)

1937 **385. (09 (.**
Railway Gazette, No. 19, November 5, p. 797.
The Russian Railway centenary. (400 words.)

7 385 .1 (.54)
ay Gazette, No. 19, November 5, p. 798.
an Railway Conference Association. (1 400 words.)

7 656 .222.1 (.42)
ay Gazette, No. 19, November 5, p. 799.
t goods train running on the L. N. E. R. (800 .)

7 625 .244 (.44)
ay Gazette, No. 20, November 12, p. 821.
is with mechanical refrigeration. (600 words &

37 621 .132.3 (.931) & 621 .132.4 (.931)
ay Gazette, No. 20, November 12, p. 822.
v general purposes locomotives for New Zealand. words & fig.)

37 656 .222.1 (.42)
ay Gazette, No. 20, November 12, p. 823.
t runs between Bristol, Leeds, and Glasgow by Midland and Glasgow & South Western Route, . S. R. (2 400 words & fig.)

37 656 .234 (.44) & 659 (.44)
ay Gazette, No. 20, November 12, p. 826.
ide tickets on the Paris Metro. (100 words & fig.)

37 621 .138.2 (.42)
ay Gazette, No. 20, November 12, p. 827.
ling locomotives at Stranraer, L. M. S. R. (400 s & fig.)

37 621 .132.3 (.436)
ay Gazette, No. 20, November 20, p. 828.
w 2-8-4 type express locomotives for the Austrian al Railways. (800 words & fig.)

37 656 .25
ay Gazette, No. 20, November 12, p. 834.
e Signal department : its relationship to the other tments of a railway. (Abstract of a paper read to Permanent Way Institution.) (1 400 words.)

37 656 .2
ay Gazette, No. 20, November 12, p. 836.
dern developments in railway operating practice. 0 words.)

37 625 .4 (.44)
ay Gazette, No. 20, November 12, p. 838.
ris Metro developments. (200 words & 1 map.)

37 621 .43
l Railway Traction, p. 754, Supplt. to the Railway Gazette, October 29.
haust gas conditioning. (1 200 words & fig.)

37 621 .43 (.944)
l Railway Traction, p. 755, Supplt. to the Railway Gazette, October 29.
sel trains for Australia. (1 100 words & fig.)

1937 621 .43
Diesel Railway Traction, p. 758, Supplt. to the Railway Gazette, October 29.
Railcar oil engines. (5 200 words & fig.)

1937 621 .43
Diesel Railway Traction, p. 766, Supplt. to the Railway Gazette, October 29.
The Ricardo combustion systems. (1 900 words & fig.)

1937 621 .336 (.42)
Electric Railway Traction, p. 858, Supplt. to the Railway Gazette, November 12.
Inductor speedometers. (800 words & fig.)

1937 621 .33 (.494) & 625 .3 (.494)
Electric Railway Traction, p. 859, Supplt. to the Railway Gazette, November 12.
Electrification of the Rigi Railway. (1 200 words & fig.)

The Railway Magazine. (London.)

1937 656 .222.1 (.42)
The Railway Magazine, No. 485, November, p. 319.
The fastest trains in Great Britain. (1 800 words & fig.)

1937 656 .222.1 (.4)
The Railway Magazine, No. 485, November, p. 323.
European express trains in the summer of 1937 — I. (1 900 words & tables.)

1937 656 .222.1 (.42)
The Railway Magazine, No. 485, November, p. 328.
ALLEN (C. J.). — British locomotive practice and performance. (6 000 words & fig.)

Railway Mechanical Engineer. (New York.)

1937 621 .13 (06 (.73)
Railway Mechanical Engineer, No. 10, October, p. 433.
General foremen's meeting. (The importance of human relations in railroading brought out by principal speakers. Car repairs, safety work and machine tools covered at sessions.) (18 500 words.)

1937 625 .2 (06 (.73)
Railway Mechanical Engineer, No. 10, October, p. 449.
Activities of Car Department officers' resumed. Relation of Car Department to safe train operation. Car men's relation to loss and damage to freight. Economics of private freight-car operation. A. A. R. mechanical and loading interchange rules. (20 500 words.)

1937 **621 .13 (06 (.73)**
Railway Mechanical Engineer, No. 10, October, p. 467.
Fuel and traveling engineers. Utilization and availability of locomotives. The influence of higher aesthetic standards. Report on fuel records and statistics. Report on the utilization of Coale valve motion and its effect on fuel economy. Front ends, grates and ashpans. Improved and new locomotive economy devices. Locomotive firing practice-oil, etc. (22 000 words & fig.)

1937 **621 .133 (06 (.73)**
Railway Mechanical Engineer, No. 10, October, p. 487.
Boiler makers' meeting (29 and 30 Sept. 1937). Special consideration is given to apprentice training, welding effects of bad water and general boiler maintenance problems. (20 000 words & fig.)

South African Railways and Harbours Magazine. (Johannesburg.)

1937 **621 .139 (.68), 625 .18 (.68) & 625 .27 (.68)**
South African Railways & Harbours Magazine, October, p. 1287.
The story of a store. (3 200 words & fig.)

The Locomotive. (London.)

1937 **621 .13 (0**
The Locomotive, No. 543, November 15, p. 337.
Locomotive development. (1 200 words.)

1937 **621 .132.3 (.71)**
The Locomotive, No. 543, November 15, p. 338.
New Hudson type locomotives, Canadian Pacific Railway. (900 words & fig.)

1937 **625 .232 (.42)**
The Locomotive, No. 543, November 15, p. 339.
The « East Anglian » train L. & N. E. R. (1 500 words & fig.)

1937 **621 .133**
The Locomotive, No. 543, November 15, p. 343.
The proportions of **locomotive boilers.** (Paper read before the Institution of Locomotive Engineers by A. F. Webber. (1 800 words.)

1937 **385. (064 (.44)**
The Locomotive, No. 543, November 15, p. 344.
The Paris Exhibition. (2 200 words & fig.)

1937 **621 .131.3 (.42)**
The Locomotive, No. 543, November 15, p. 347.
Dynamometer tests on Midland & Northern Divisions, L. M. S. R. (1 000 words & fig.)

1937 **621 .13 (0**
The Locomotive, No. 543, November 15, p. 349.
PHILLIPSON (E. A.). — **The steam locomotive in traffic.** (2 000 words). (To be continued.)

1937 **385. (**
The Locomotive, No. 543, November 15, p. 351.
ELLIS (C. H.). — **Famous locomotive engineers** III. Charles Beyer. (3 600 words & fig.)

1937 **621 .132.1 (.**
The Locomotive, No. 543, November 15, p. 355.
MORRIS (O. J.). — Standardizing Southern Railw Locos, Central Section. (3 000 words & fig.)

1937 **621**
The locomotive, No. 543, November 15, p. 361.
Light-weight railcar design. (1 700 words & fig.)

1937 **625 .232 (.**
The locomotive, No. 543, November 15, p. 364.
New post office sorting vans, L. M. S. Railway. (words & fig.)

The Oil Engine. (London.)

1937 **621**
The Oil Engine, No. 55, Mid November, p. 208.
Progress in pressure charging. (1 400 words & fig.)

1937 **621 .43 & 621**
The Oil Engine, No. 55, Mid November, p. 220.
Remote control for railcar gearboxes. (1 200 word fig.)

Transactions, American Society of Mechanical Engineers. (New York.)

1937 **669**
Transactions, Americ. Soc. of Mech. Engineers, No October, p. 541.
CLARK (C. L.). — **A new low-alloy pearlitic steel** high-temperature service. (2 600 words & fig.)

1937 **62. (01 & 621**
Transactions, Americ. Soc. of Mech. Engineers, No October, p. 555.
KRAUS (C. E.) and WEDDELL (R. R.). — Determ ing the **tool-life cutting-speed** relationship by fac cuts. (3 700 words & fig.)

1937 **621 .1 & 621**
Transactions, Americ. Soc. of Mech. Engineers, No October, p. 559.
BOYER (G. C.). — Analysing variable loads in ste and diesel-power plants. (3 600 words & fig.)

1937 **621 .**
Transactions, Americ. Soc. of Mech. Engineers, No October, p. 563.
PIERSON (O. L.). — Experimental investigation the influence of tube arrangement on convection h transfer and flow-resistance in cross flow of gases o tube banks. (6 800 words & fig.)

621 .116

ctions, Americ. Soc. of Mech. Engineers, No. 7, tober, p. 573.

E (E. C.). — Experimental investigation of of equipment size on convection heat transfer ow resistance in cross flow of gases over tube (7 000 words & fig.)

---

621 .116

ctions, Americ. Soc. of Mech. Engineers, No. 7, tober, p. 583.

MISON (E. D.). — Correlation and utilization of ta on flow resistance and heat transfer for cross f gases over tube banks. (10 500 words & fig.)

621

ctions Americ. Soc. of Mech. Engineers, No. 7, tober, p. 595.

TH (Ed. S.) and FAIRCHILD (C. O.). — **Indus-nstruments,** their theory and application. (10 000 & fig.)

621

ctions Americ. Soc. of Mech. Engineers, No. 7, tober, p. 609.

ERTON (C. T.). — Abstract of progress report on **heavy helical springs.** (1 600 words & tables.)

---

656 .221

ctions Americ. Soc. of Mech. Engineers, No. 7, tober, p. 617.

ETZ (A. I.). — **Air resistance** of railroad equip- (16 000 words & fig.)

Transit Journal. (New York.)

388. (.73)

t Journal, No. 11, October, p. 424.

ineering progress in the spotlight. (Advances re- along many lines. Power, rolling stock, and way ructures divisions at separate sessions consider accomplished during the year « A. T. A. News- shows many improvements in practice during the (3 500 words.)

---

388. (.73)

t Journal, No. 11, October, p. 429.

fares — new vehicles — new services. Case les of increased revenues resulting from improved ient and methods discussed by Operating Asso- . (1 800 words.)

---

388. (.73) & 625 .27 (.73)

; Journal, No. 11, October, p. 436.

unting for scrap materials. (1 000 words.)

In Spanish.

Boletín de la Asociación internacional permanente del Congreso Sudamericano de ferrocarriles. (Buenos Aires.)

1937 385. (09.3 (.82)

Boletin de la Asoc. intern. perm. del Congreso Sud-americ. de ferrocar., julio-septiembre, p. 15.

POOLE (J.). — Aniversario del **primer ferrocarril** argentino. (1 700 palabras & fig.)

1937 651

Boletin de la Asoc. intern. perm. del Congreso Sud-americ. de ferrocar., julio-septiembre, p. 23.

BACH (E.). — El uso de **maquinas tabuladoras** en un ferrocarril. (13 000 palabras & fig.)

1937 313 .385

Boletin de la Asoc. intern. perm. del Congreso Sud-americ. de ferrocar., julio-septiembre, p. 59.

JUNG (H. F.). — La **estadistica ferroviaria.** (2 800 palabras & cuadros.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1937 621 .131.1

Annali dei lavori pubblici, agosto, p. 655.

TARTARINI (W.). — Sul **tracciamento del diagramma** presunto ai fini della predeterminazione della potenza di una **locomotiva a vapore.** (8 900 parole & fig.)

1937 625 .1 (.45)

Annali dei lavori pubblici, agosto, p. 675.

La **ferrovia Fidenza-Salsomaggiore.** (2 600 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1937 621 .138.1 (.45)

Rivista tecnica delle ferrovie italiane, 15 ottobre, p. 255.

RISSONE. — Il nuovo **deposito locomotive** di Reggio Calabria. (2 200 parole & fig.)

1937 625 .13

Rivista tecnica delle ferrovie italiane, 15 ottobre, p. 262.

CORINI (F.). — Sulle caratteristiche del **tracciato in galleria** in rapporto alla **resistenza supplementare del mezzo.** (4 600 parole.)

In Dutch.

De Ingenieur. (Den Haag.)

1937 **691 & 721 .9**

De Ingenieur, Nr. 45, 5 November, p. Bt. 70.

ROELOFSEN (E.). — Beschouwingen over speciale **betondeklagen** voor bedrijfsvloeren en daarmede samenhangende vraagstukken. (7 500 woorden & fig.)

1937 **656 .225 (.492)**

De Ingenieur, Nr. 46, 12 November, p. V. 71.

ENTE (J.). — De nieuwe wijze van **vervoer van goederen** bij de Nederlandsche Spoorwegen. (11 400 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1937 **385. (09 (.52)**

Spoor- en Tramwegen. Nr. 22, 26 October, p. 491; Nr. 23, 9 November, p. 525; Nr. 24, 23 November, p. 548.

BERG (G. F.). — **Indrukken van een reis naar de Japansche Spoorwegen.** (9 000 woorden & fig.)

1937 **656 (.42)**

Spoor- en Tramwegen. Nr. 24, 23 November, p. 543.

Pogingen tot **samenwerking van verkeersbedrijven** in Engeland. (1 400 woorden.)

In Polish.

(→ 91.885.)

Inżynier Kolejowy. (Warszawa).

1937 **624 .9 = 91**

Inzynier Kolejowy. No. 11, p. 426.

SZELAGOWSKI (F.). — Geometrical method o **culating the stresses in framework parts.** (4 200 & fig.)

1937 **625 .216 = 91**

Inzynier Kolejowy, No. 11, p. 434.

LANGROD (A.). — Progress made in the desi **rolling stock buffers.** (6 000 words & fig.)

1937 **621 .13 = 91 .885 & 621 .43 = 91**

Inzynier Kolejowy, No. 11, p. 444.

OGUREK (O.). — **Railcars, diesel locomotive steam locomotives** as seen from the reports and d sions at the XIIIth International Railway Congres at the Paris International Exhibition. (3 600 wo fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1937

Gazeta dos caminhos de ferro, No. 1198, 16 de nove p. 527.

A concorrência do automóvel e a situação dos c hos de ferro. (2 100 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(FEBRUARY 1938)

. 385. (02]

I. — BOOKS.

In French.

691 & 721 .9

SSEAU (L.).
es de calcul et de contrôle exacts et instantanés
s sections de béton armé.
Dunod. 1 volume (25 × 32), 82 pages. (Prix : français.)

621 .43

LOU (Y.).
uction à l'étude pratique des moteurs à com-
interne.
(6e), Dunod, 92, rue Bonaparte. 1 volume 5), 175 pages et 73 figures. (Prix : 54 fr. franç.)

669 & 691

et DAESCHLE.
tallisation par projection.
Dunod, 92, rue Bonaparte. 1 volume, 211 pages ures. (Prix : 54 fr. français.)

In German.

621 .13

ahre Borsig Lokomotiven 1837-1937.
, V-D-I-Verlag. 1 Band, 103 Seiten und Abbil- (Preis : 7 R.M.)

62. (01

H (A.).
te » Taschenbuch der Stoffkunde (Stoffhütte).
, Wilhelm Ernst and Sohn. 1 Band, 1 008 Seiten Textabbildungen. (Preis : 24 R.M.)

In English.

621 .86

TON (W. H.).
ving machinery.
n : Technical Press, Ltd., 5, Ave Maria-lane. (Price : 21 s. net.)

1937 621 .7

ATKINS (E. A.).
Practical sheet steel and plate metal work. Fourth edition.
London : Sir Isaac Pitman and Sons, Ltd., Parker-street, W. C. 2. (Price : 30 s. net.)

1937 624

GRINTER (L. E.).
Theory of modern steel structures. Vol. 2 : statically indeterminate structures and space frames.
London : MacMillan and Co., Ltd., St. Martins-street, W. C. 2. (Price : 20 s. net.)

1937 529. (06

Journal of Calendar reform. October.
New York : The World Calendar Association, Inc., International Building, 630, Fifth Avenue. A pamphlet of 176 pages.

1937 385. (08 (.68)

Report of the Central Road Transportation Board for the year ended 31st March, 1937.
Union of South Africa : published by Authority. 39 pp. (Price : 2 s.)

1937 621 .43

ROSBLOOM (J.).
Diesel hand-book. Fourth edition.
London : The Australian Book Company, 37, Great Russell-street, W. C. 1. (Price : 25 s. net.)

1937 621 .133.7

RYAN (W. J.).
Water treatment and purification.
New York : McGraw-Hill Book Co. Inc. 242 pp. (Price : $ 2.50.)

1937 016. 62

Selected bibliography of engineering subjects. — Section 1 : mathematics, mechanics, physics. Section 2 : aeronautical engineering, civil engineering. Section 3 : chemistry, chemical engineering, industrial engineering. Section 4 : electrical engineering, mechanical engineering. Section 5 : metallurgy, minerology and geology, mining engineering.
Published by the Engineers Council for Professional Development, 29 W. 39th St. New York City. (Price : 10 c. per copy or 5 c. in quantities of 50 or more.)

[1] The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress by with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*,

1937 **614 .7**

Smoke and boiler ordinances.

Compiled and published for the Smoke Prevention Association, Secretary Frank A. Chambers, Room 1001, City Hall, Chicago. 152 pages, 6 in. by 9 in. (Price : paper-bound, 50 cents.)

1937 **624 .2**

SPOFFORD (Ch. M.).

The theory of continuous structures and arches.

London : McGraw-Hill Publishing Company, Limited. (Price : 21 s.)

1937 **625 .144.2 & 625 .172**

STRICK (R.).

Note on reconditioning of curves.

Railway Board, India. Technical Paper No. 301. Delhi : The Manager of Publications. (Price : 9 annas, or 1 s.)

1937 **385. (091**

THE RAILWAY GAZETTE.

1937 Annual Overseas Railways Number (Nov 24, 1937) containing a series of articles on most leading railway systems in Canada, Africa, Aus New Zealand, India, Ceylon, Argentina, Brazil and places. A volume (10 × 8 3/4 inches), of 128 profusely illustrated.

Published by « The Railway Gazette », Londo Tothill Street, Westminster, S.W. 1 (Price : 2 sh

---

1937 **62**

THOMSEN (T. C.).

The practice of lubrication. An engineering t on the origin, nature and testing of lubricants, selection, application and use. Third edition.

London : McGraw-Hill Publishing Company, Li (Price : 36 s.)

[**016. 385.** (05]

II. — PERIODICALS.

In French.

Annales des Ponts et Chaussées (Paris).

1937 **625 .122 (.66)**

Annales des ponts et chaussées, août, p. 182.

PIALOUX (J.). — **Construction de voies ferrées** en Côte d'Ivoire. Essais sur la résistance des terrains. (14 000 mots & fig.)

Bulletin technique de l'Association des Ingénieurs sortis de l'Ecole Polytechnique de Bruxelles. (Bruxelles.)

1937 **621 .43**

Bull. tech. de l'Association des Ing. sortis de l'Ecole Polytech. de Bruxelles, n° 6, p. 101.

DUCARME (J.). — Le **moteur à combustion interne** et les **carburants liquides.** (8 400 mots.)

Bulletin technique de la Suisse romande. (Vevey.)

1937 **624 .9 (.494)**

Bull. tech. de la Suisse romande, n° 26, 18 déc., p. 327.

ZWAHLEN (J.). — L'**ossature métallique** dans la transformation de l'Hôtel des Postes de Lausanne. (1 900 mots & fig.)

1937 **691 & 721 .9**

Bull. tech. de la Suisse romande, n° 26, 18 déc., p. 331.

SCHNEIDER (G.). — Dalles massives en **béton armé.** (1 100 mots & fig.)

1937 **621 .335 (.494)**

Bull. tech. de la Suisse romande, n° 26, 18 déc., p. 333.

Les **trains automoteurs rapides** des Chemins de fer Fédéraux suisses. (800 mots.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1937 **38**

Bull. des transp. intern. par ch. de fer, novembre,

POLLACZEK (G.). — La **responsabilité collect** la qualité de défendeur au procès (légitimation pa (2 200 mots.)

1937 **313 .385 (**

Bull. des transp. intern. par ch. de fer, novembre,

Statistique des chemins de fer de l'Etat finl pour l'année 1935. (500 mots.)

Chronique des transports. (Paris.)

1937 **656 .2**

Chronique des transports, n° 22, 25 novembre.

Le problème des **wagons métalliques** et la sé des voyageurs (600 mots.)

1937 **621 .33**

Chronique des transports, n° 22, 25 novembre,

L'**électrification** des chemins de fer italiens. mots.)

1937 **385 .1**

Chronique des transports, n° 23, 10 décembre,

Les **perspectives financières** des chemins de fe 1938. (2 000 mots.)

1937 **656 .225 (.43) & 656 .261**

Chronique des transports, n° 23, 10 décembre,

Le **trafic de porte à porte** de la Reichsbahn mots.)

Électricité. (Paris.)

621 .335 (.44)

ité, novembre, p. 405.

LET (V.) & NOUVION (F.). — Les **nouvelles** trices rapides de grande banlieue du Réseau de (Electrification de la ligne Paris-Le Mans.) mots & fig.) (A suivre.)

Génie civil. (Paris.)

621 .33 (.44)

ivil, n° 2885, 27 novembre, p. 450.

HELLERY (A.). — L'**électrification** des chemins le Paris à Orléans et du Midi. (5 700 mots & fig.)

669

ivil, n° 2886, 4 décembre, p. 473.

LET (L.). — Les **traitements thermiques** et la structurale. (4 700 mots & fig.)

---

62. (01

ivil, n° 2886, 4 décembre, p. 478.

GAS (Ph.). — Résolution graphique de quelques es usuelles pour le calcul des arbres cylindriques à la torsion et à la flexion. (1 900 mots & fig.)

---

669 .1 (.44)

ivil, n° 2886, 4 décembre, p. 482.

ances actuelles de la fabrication des **aciers spé**n France. (900 mots.)

691

ivil, n° 2887, 11 décembre, p. 501.

osition granulométrique correspondant à la plasptima du **béton** et à sa résistance maxima dans **n armé.** (3 000 mots & fig.)

531

ivil, n° 2888, 18 décembre, p. 527.

de de l'état des **surfaces métalliques entrant en** dans les machines. (2 300 mots & fig.)

---

621 .392

ivil, n° 2888, 18 décembre, p. 529.

oudure électrique à l'arc des diverses nuances de la fonte et des principaux métaux et alliages reux. (3 400 mots & fig.)

La Technique moderne. (Paris.)

621 .134.1 (.44) & 621 .134.5 (.44)

nique moderne, n° 23, 1er décembre, p. 777.

TEL (M.). — Le **graissage des cylindres** de loes sur les réseaux français. (7 000 mots & fig.)

La Traction électrique. (Paris.)

621 .335 (.494)

tion électrique, septembre, p. 119.

rains automoteurs rapides des Chemins de fer x suisses. Rc 8/12, nos 501 et 502. (1 600 mots.)

1937 **621 .33 (.44)**

La Traction électrique, septembre, p. 121.

VILLENEUVE (J.). — La **technique de l'électrification** des Chemins de fer de Paris à Orléans et du Midi. (5 400 mots & fig.)

1937 **621 .33 (.68)**

La Traction électrique, septembre, p. 133.

L'**électrification** des Chemins de fer de l'Afrique Australe. (600 mots & fig.)

1937 **621 .33 (.47)**

La Traction électrique, septembre, p. 133.

La **traction électrique** en Russie. (1 200 mots.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1937 **625 .4**

L'Ind. des voies ferrées et des transp. aut., oct., p. 219.

GADOT (P.). — La **circulation souterraine des véhicules** dans les grandes agglomérations. (2 400 mots & fig.)

L'Ingénieur-Constructeur. (Paris.)

1937 **624**

L'Ingénieur-Constructeur, oct.-nov.-déc., p. 4173.

CHRISTENSEN (J.). — **Ponts** en poutres Vierendeel. (2 700 mots, 2 tableaux & fig.)

1937 **624 .2**

L'Ingénieur-Constructeur, oct.-nov.-déc., p. 4191.

MAREZ (R.). — Applications de la méthode de Bachinsky aux **poutres hyperstatiques.** (1 900 mots & fig.)

1937 **624 .2**

L'Ingénieur-Constructeur, oct.-nov.-déc., p. 4195.

COUTURE (J.). — Une méthode d'analyse des **poutres hyperstatiques** et des portiques à angles rigides. (600 mots.)

L'Ossature métallique. (Bruxelles.)

1937 **624 .32 (.489)**

L'Ossature métallique, décembre, p. 567.

ENGELUND (A.). — Le **pont** sur le Storström. (2 300 mots & fig.)

1937 **62. (01 & 669 .1**

L'Ossature métallique, décembre, p. 585.

JOUKOFF (A. S.). — Les essais d'endurance sur les **aciers de construction.** (2 700 mots & fig.)

1937 **624 .2**

L'Ossature métallique, décembre, p. 591.

BAES (L.). — La **poutre Vierendeel.** Problèmes spéciaux. (8 000 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1937 **621 .133.1**

Revue générale des chemins de fer, 1er décembre, p. 323.

GALONIER. — Recherches de laboratoire sur la **valeur d'usage des charbons en matière de traction.** (3 000 mots & fig.)

1937 **625 .144.2 (.44) & 625 .172 (.44)**

Revue générale des chemins de fer, 1er décembre, p. 331.

LANOS & LEGUILLE. — Mise en service sur le réseau de l'Est d'une **machine contrôlant le tracé des courbes.** (6 000 mots & fig.)

1937 **625 .1 (.44)**

Revue générale des chemins de fer, 1er décembre, p. 342.

CHAUDRE (P.). — La **nouvelle ligne** de Saint-Dié à Sainte-Marie-aux-Mines. (4 400 mots & fig.)

1937 **625 .14 (01, 621 .135 (01 & 625 .2**

Revue générale des chemins de fer, 1er décembre, p. 353.

BANCELIN. — **Méthode d'enregistrement de faibles déplacements.** Résultats de quelques mesures. (2 100 mots & fig.)

1937 **625 .13 & 656 .253**

Revue générale des chemins de fer, 1er décembre, p. 356

LEVI (R.). — Emploi de **tubes luminescents** comme **complément des signaux sous tunnels.** (1 700 mots & fig.)

1937 **621 .43**

Revue générale des chemins de fer, 1er décembre, p. 36[illegible]

Moteurs Diesel à cylindres horizontaux pour autos motrices. (1 100 mots & fig.)

Revue universelle des Mines. (Liége.)

1937 **625 .14**

Revue universelle des mines, décembre, p. 512.

CAMPUS (R.). — La **modernisation de la voie ferrée.** (4 500 mots & fig.)

In German.

Die Reichsbahn. (Berlin.)

1937 **385 .59 (.43)**

Die Reichsbahn, Heft 47, 24 November, S. 1035.

VOGEL. — **Reichsbahn und Luftschutz.** (9 500 Wörter.)

1937 **656 .222 & 656 .254**

Die Reichsbahn, Heft 48, 1. Dezember, S. 1056.

FREYSS. — **Fahrdienstleitung. — Betriebsüberwachung. — Betriebsleitung.** (6 300 Wörter.)

Glasers Annalen. (Berlin.)

1937 **621 .335**

Glasers Annalen, Heft 10, 15. November, S. 162.

TETZLAFF (H.). — **Elektrische Triebwagen** für Fahrleitungsbetrieb. (2 900 Wörter & Abb.)

Organ für die Fortschritte des Eisenbahnwes (Berlin.)

1937 **621 .43 (**

Organ für die Fortschr. des Eisenbahnw., Heft 1. Dezember, S. 421.

BREUER (R. M.). — Neue vierteilige, **dieselelektrische Schnelltriebwagen** der Deutschen Reichsb (6 200 Wörter & Abb.)

1937 **625 .23 &**

Organ für die Fortschr. des Eisenbahnw., Heft 1. Dezember, S. 429.

SPIES (R.). — Neue ausländische **Leichtstahl Personenwagen.** (1 800 Wörter & Abb.)

1937 **625 .1**

Organ für die Fortschr. des Eisenbahnw., Heft 15. Dezember, S. 439.

FINDEIS (R.). — Die **neuere Form des Übergangbogens im Eisenbahngleis.** (2 300 Wörter & Abb.)

1937 **621 .392 & 625**

Organ für die Fortschr. des Eisenbahnw., Heft 15. Dezember, S. 443.

LEDERLE. — **Sicherheit gegen Verwerfung** im durchgehend geschweissten Gleis. (3 300 Wörter & Abb.)

1937 **621 .43 (**

Organ für die Fortschr. des Eisenbahnw., Heft 15. Dezember, S. 448.

HÜTTEBRÄUCKER (E.). — Der **Triebwagenwagen** der Deutschen Reichsbahn. (4 700 W & Abb.)

1937 **621 .1**

Organ für die Fortschr. des Eisenbahnw., Heft 15. Dezember, S. 454.

Koksgewinnung aus Lokomotivfeuerungsrückstä (700 Wörter.)

Zeitschrift des Vereines Deutscher Ingenieu (Berlin.)

1937 **625 .234 (**

Zeitschrift des Ver. deutsch. Ing., Nr. 48, 27 Nover S. 1383.

MAUCK (P.). — **Klimaanlage** für Doppeldeck-E bahnwagen. (3 000 Wörter & Abb.)

1937 **625 .2 & 656**

Zeitschrift des Ver. deutsch. Ing., Nr. 48, 27 Nover S. 1386.

VOGELPOHL (G.). — **Luftwiderstand von Sch zügen** auf Grund von Windkanalversuchen. (1 300 ter & Abb.)

1937 **62. (01 & 621**

Zeitschrift des Ver. deutsch. Ing., Nr. 49, 4 Dezer S. 1403.

WIDEMANN (M.). — Der Bindefehlernachwei **Schweissnähten** in Stahl durch Röntgenstrahlen. Wörter & Abb.)

625 .25

rift des Ver. deutsch. Ing., Nr. 50, 11 Dezember, 1437.

'Z (H.). — Die Berechnung von **Backenbremsen.** Wörter & Abb.)

---

621 .114

rift des Ver. deutsch. Ing., Nr. 51, 18 Dezember, 1467.

IPPOVICH (A. v.). — Forschung auf dem Ge- er **Schmierung** und der **Schmiermittel.** (7 000 Wör- Abb.)

---

eitung der Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

656 .225 & 656 .261

der Ver. mitteleurop. Eisenbahnverw., Nr. 47, 843.

IENDAHL (A.). — Der **Kleinbehälter** von heute orgen. (2 300 Wörter & Abb.)

---

385 .113 (.44)

der Ver. mitteleurop. Eisenbahnverw., Nr. 47, 846.

ranzösischen Eisenbahnen im Jahre 1936. (6 500 .)

---

656 .225 (.43)

der Ver. mitteleurop. Eisenbahnverw., Nr. 48, Dezember, S. 863.

IBE. — **Spediteur und Reichsbahn.** (2 400 .)

---

625 .23 (.494) & 669 .1 (.494)

der Ver. mitteleurop. Eisenbahnverw., Nr. 48, Dezember, S. 866.

tstahlwagen der Schweizerischen Bundesbahnen. Wörter & Abb.)

In English.

---

ulletin, American Railway Engineering Association. (Chicago, III.)

693 (.73)

n, Americ. Ry. Engineering Assoc., No. 399, Nov., 135.

rt of Committee VIII. — **Masonry.** Revision of . Specifications for Portland cement concrete, nd reinforced. Specifications and principles of of plain and reinforced concrete and of brick, s in the Science and Art of concrete manu- . Specifications for foundations. Placement of e by pumping. (6 400 words.)

---

624. (.73) & 721 .9 (.73)

n, Americ. Ry. Engineering Assoc., No. 399, Nov., 153.

t of Committee XV. — **Iron and steel struc-** Revision of manual. Revision of specifications el railway bridges. Specifications for fusion welding and gas cutting for steel structures. Design of rivet heads for steel structures. Review specifications for overhead highway bridges of Association of State Highway Officials insofar as they relate to steel construction. (6 600 words & fig.)

1937 **62. (01 (.73) & 624. (.73)**

Bulletin, Americ. Ry. Engineering Assoc., No. 399, Nov., p. 173.

Report of special Committee on impact. (200 words.)

Electrical Industries. (London.)

1937 **621 .31**

Electrical Industries, No. 1905, December, p. 1348.

ELLIS (A. G.). — **Transformer trends.** (3 100 words & fig.)

1937 **621 .332**

Electrical Industries, No. 1905, December, p. 1351.

HUNTER (P. V.) and ALLCOCK (H. J.). — **Modern power cable design.** (4 000 words & fig.)

Engineer. (London.)

1937 **621 .132.3 (.42)**

Engineer, No. 4272, November 26, p. 598.

The rebuilt L. N. E. R. engine « No. 10000 ». (700 words & fig.)

1937 **621 .116**

Engineer, No. 4272, November 26, p. 602.

The mechanics of flame and air jets. (1 400 words).

1937 **621 .43 (.42)**

Engineer, No. 4272, November 26, p. 604.

A direct-reversing oil-engined locomotive. (1 000 words & fig.)

1937 **621 .134.1**

Engineer, No. 4273, December 3, p. 622, and No. 4274, December 10, p. 656.

REED (B.). — **Locomotive connecting and coupling rod design.** (5 900 words, tables & fig.)

1937 **62. (064 (.42)**

Engineer, No. 4273, December 3, p. 622, and No. 4274, December 10, p. 636.

The **Public Works Exhibition.** (4 700 words & fig.)

1937 **621 .115**

Engineer, No. 4274, December 10, p. 650.

DOWSON (R.). — **Performance of single-stage steam jet operated ejectors.** (2 500 words & fig.)

1937 **621 .392**

Engineer, No. 4274, December 10, p. 658.

A new welding transformer. (1 200 words & fig.)

1937 **0**

Engineer, No. 4274, December 10, p. 661.

Technical translations. (1 200 words.)

1937 **0**
Engineer, No. 4274, December 10, p. 665.
HOLMSTROM (J. E.). — **Technical translating.** (1 400 words.)

1937 **621 .43**
Engineer, No. 4274, December 10, p. 668.
SMALL (J.). — **Vagaries of internal combustion.** (3 700 words & fig.)

Engineering. (London.)

1937 **62. (06 (.42)**
Engineering, No. 3749, November 19, p. 561.
The National Physical Laboratory (Thermal properties of engineering materials; Evaporation and refrigeration, etc.). (5 000 words & fig.)

1937 **388**
Engineering, No. 3749, November 19, p. 569.
The **electro-matic system of traffic control** in Piccadilly Circus. (1 400 words.)

1937 **621 .138.2 (.42)**
Engineering, No. 3749, November 19, p. 576.
Locomotive coal-loading plant at Stranrear. (700 words.)

1937 **669 .1**
Engineering, No. 3749, November 19, p. 581.
JONES (B.). — Further **experiments on the nitrogen-hardening of high-chromium and austenitic steels.** (3 400 words & fig.)

1937 **656 .262 (.42)**
Engineering, No. 3750, November 26, p. 589.
The Queen's Hotel, Leeds (L. M. S. R.). (2 900 words & fig.)

1937 **62. (01**
Engineering, No. 3750, November 26, p. 595.
A test-piece for « **triple tensile stress** ». (300 words & fig.)

1937 **621 .43 (.42)**
Engineering, No. 3750, November 26, p. 604.
Direct-reversing diesel locomotive. (1 000 words & fig.)

1937 **621 .116**
Engineering, No. 3750, November 26, p. 608.
DAVIS (R. F.). — **The mechanics of flame and air jets.** (3 900 words & fig.)

1937 **62. (01 & 669**
Engineering, No. 3751, December 3, p. 615.
BAILEY (R. W.). — **Flanged pipe joints** for high pressures and temperatures. (2 500 words.)

1937 **62. (064 (.42)**
Engineering, No. 3751, December 3, p. 617 and No. 3752, December 10, p. 647.
The Public Works, Roads and Transport Exhibition. (8 600 words & fig.)

1937 **62**
Engineering, No. 3751, December 3, p. 634.
Precision sliding, surfacing and screw-cutting l
(1 200 words.)

1937 **625 .13 (**
Engineering, No. 3752, December 10, p. 651.
The reconstruction of the Menai bridge. (2 000 wo

1937 **62.**
Engineering, No. 3752, December 10, p. 652.
Torsional damping recorder. (2 500 words.)

1937 **656 .2**
Engineering, No. 3752, December 10, p. 657.
Railway acceleration. (2 100 words.)

1937 **621 .133.8 (**
Engineering, No. 3752, December 10, p. 661.
Speedometers for Great Western Railway locomot
(300 words.)

1937
Engineering, No. 3752, December 10, p. 669.
BATEMAN (E. H.). — **The analysis of elastic s**
tures. (3 800 words & fig.)

Engineering News-Record. (New York.)

1937
Engineering News Record, No. 21, November 18, p.
ANDERSEN (P.). — **Designing piers on pile**
resist ship impact. (1 200 words.)

1937 **621 .39 (.73) & 624 .8**
Engineering News Record, No. 21, November 18, p
HAMILTON (C. P.). — **Operating movable br**
(2 500 words & fig.)

1937 **624 .7**
Engineering News Record, No. 22, November 25, p
GEISLER (C. D.). — **Rigid-frame rocker bents.**
words & fig.)

1937 **624 .7**
Engineering News Record, No. 23, December 2, p
Thin slab railroad bridge in service 24 years.
words & fig.)

Journal, Institute of Transport. (London.

1937
Journal, Institute of Transport, No. 2, December,
BARRINGTON-WARD (V. M.). — **Modern de**
ments in railway operating practice. (16 000 wor

1937 **656.**
Journal, Institute of Transport, No. 2, December,
WYMER (F. J.). — **Transport in France.**
words & fig.)

388. (.42)
l, Institute of Transport, No. 2, December, p. 75.
MAS (T. E.). — **How London's road passenger ort works.** (3 300 words.)

Journal, Institution of Civil Engineers. (London.)

624. (.42)
l, Institution of Civil Engineers, November, p. 25.
LENFANT (H. G.). — **A pre-cast reinforced-con- underline railway-bridge.** (3 500 words & fig.)

---

625 .13 (.54)
l, Institution of Civil Engineers, November, p. 49.
ENHILL (D. W.) and WILSON (G.). — **The truction of the Inchcape bridge,** Bengal and North rn Railway. (3 600 words & fig.)

---

62. (01 & 624 .2
l, Institution of Civil Engineers, November, p. 119.
(F. C.) and WHITMAN (J. G.). — **The failure ers under repeated stresses.** (12 000 words & fig.)

---

621 .4
l, Institution of Civil Engineers, Decemb., p. 166.
KEY (W. A.). — **Combustion-efficiencies of gas il engines.** (Paper No. 5148, with discussion.) words, tables & fig.)

---

627 (.42) & 656 .213 (.42)
l, Institution of Civil Engineers, Decemb., p. 223.
SON (G. E.). — **Dover train-ferry dock.** (Paper 46, with discussion.) (19 000 words & fig.)

---

rnal, Institution of Engineers, Australia. (Sydney.)

621 .43 (.944) & 656 .222.1 (.944)
l, Institution of Engineers, Australia, No. 10, tober, p. 391.
NG (H.). — **High speed railway transport,** in- a description of the diesel train of the New Wales Government Railways. (12 500 words &

---

don & North Eastern Railway Magazine. (London.)

621 .138.5 (.42)
n & North Eastern Railway Magazine, No. 11, vember, p. 632.
PERCORN (A. H.). — Locomotive weighing ma- on the L. N. E. R. (3 000 words & fig.)

---

385. (091 (.56)
& North Eastern Railway Magazine, No. 12, cember, p. 692.
HAM (M. A.). — **The Railways of Palestine.** words & 1 map.)

Mechanical Engineering. (New York.)

1937 621 .7
Mechanical Engineering, No. 12, December, p. 896.
GIBBONS (J. W.). — **Possibilities of metal spraying.** (1 200 words.)

1937 621 .9
Mechanical Engineering, No. 12, December, p. 897.
JUDKINS (M. F.). — Grinding of sintered carbide-tipped tools. (3 400 words & fig.)

1937 614 .8
Mechanical Engineering, No. 12, December, p. 923.
GARDINER (G. L.). — Adequate job training for accident prevention. (2 500 words.)

1937 621 .13 (0, 621 .335 & 621 .43
Mechanical Engineering, No. 12, December, p. 931.
Progress in **railroad mechanical engineering in 1937.** (9 500 words & fig.)

1937 621 .143
Mechanical Engineering, No. 12, December, p. 956.
Continuous welded rail. (900 words.)

Modern Transport. (London.)

1937 621 .33 (.44)
Modern Transport, No. 975, November 20, p. 3.
Railway electrification in France. (1 800 words.)

1937 38 & 656
Modern Transport, No. 975, November 20, p. 4.
MARSDEN (A. G.). — **Transport and industry.** (2 300 words.)

1937 656 .262 (.42)
Modern Transport, No. 975, November 20, p. 5.
L. M. S. enterprise in Leeds. Lord Harewood opens **Queen's hotel.** (1 000 words & fig.)

1937 656 .2 (06 (.42)
Modern Transport, No. 975, November 20, p. 7.
Railway officers discuss **operating practice.** Merits and achievements of high-speed trains. Views expressed at Institute of Transport meeting. (5 300 words.)

1937 656
Modern Transport, No. 976, November 27, p. 3.
The transport official of the future. (1 800 words.)

1937 621 .132.1 (.42)
Modern Transport, No. 976, November 27, p. 5.
Hundreth L. N. E. R. « Pacific » locomotive. Presentation to Sir Nigel Gresley. (1 500 words.)

1937 656 .1 (.42)
Modern Transport, No. 976, November 27, p. 7.
Traffic commissioners discuss **road transport.** (1 800 words.)

1937 **621 .132.3 (.42)**

Modern Transport, No. 976, November 27, p. 9.

Conversion of L. N. E. R. locomotive « No. 10 000 ». (1 700 words & fig.)

1937 **656**

Modern Transport, No. 976, November 27, p. 12.

SMITH (F.). — **Towards transport co-ordination.** (2 000 words.)

1937 **625 .1 (.42)**

Modern Transport, No. 977, December 4, p. 3.

Engineering works on the Southern Railway. Incidental to Portsmouth and Alton electrification. (1 700 words & fig.)

1937 **656 .255 (.82)**

Modern Transport, No. 977, December 4, p. 4.

The tremain token exchanger. (900 words.)

1937 **385. (093 (.436)**

Modern Transport, No. 977, December 4, p. 7.

SCHÖPFER (A.). — **Centenary of Austrian Federal Railways.** (1 200 words & fig.)

1937 **385 .517.6 (.42)**

Modern Transport, No. 977, December 4, p. 8.

Eyesight on the Railways. An expert's retirement. (900 words.)

1937 **621 .35 (.42)**

Modern Transport, No. 977, December 4, p. 11.

Batteries for transport services. A visit to the « Exide » works. (1 700 words.)

1937 **656. (.42)**

Modern Transport, No. 977, December 4, p. 14.

Possible results of T. A. C. report. — **Can road-rail receipts be pooled?** (1 800 words.)

1937 **624 .32 (.54)**

Modern Transport, No. 978, December 11, p. 3.

New railway bridge for Eastern Bengal. (2 300 words & fig.)

1937 **621 .43 (.42)**

Modern Transport, No. 978, December 11, p. 4.

Oil-electric locomotives for Southern Railway. (1 300 words & fig.)

1937 **625 .212**

Modern Transport, No. 978, December 11, p. 6.

Rubber-tyred vehicles for railways. (1 700 words & fig.)

1937 **656 .257**

Modern Transport, No. 978, December 11, p. 9.

Railway signalling development. Relay interlocking. (1 100 words.)

New Zealand Railways Magazine. (Wellington

1937 **621 .13 (093 (.**

New Zealand Railways Magazine, No. 6, Septemb., p.

GARLICK (J. J.). — The first engine employed a public railway and others. (2 500 words & fig.)

Proceedings, American Society of Civil Engineers. (New York.)

1937

Proc., Amer. Soc. Civil Eng., No. 9, November, p. 1

Increasing the traffic capacity and safety of thorou fares; a symposium (4 articles : causes of failure handling traffic; remedies to relieve traffic congesti improvements to reduce traffic accidents; economics alignment, grade and width). (27 500 words & tabl

---

Railway Age. (New York.)

1937 **656 .258 (.**

Railway Age, No. 21, November 20, p. 716.

N. Y. C. installs first **button-control route interlo ing.** (3 000 words & fig.)

1937 **621 .138 (.**

Railway Age, No. 21, November 20, p. 723.

Engine terminal at Flat Rock built to high standa (2 700 words & fig.)

1937 **62. (01 & 625 .23**

Railway Age, No. 21, November 20, p 729.

MUSSEY (W. H.). — **Car design and construct** (4 600 words.)

1937 **656 .212.6 (.73) & 656 .213 (.**

Railway Age, No. 22, November 27, p. 751.

New car dumper in service at Huron, Ohio. (2 words & fig.)

1937 **656 .212 (.73) & 656 .225 (.**

Railway Age, No. 22, November 27, p. 755.

World's fastest freight train. (2 100 words & fig.

1937 **625 .232 (.**

Railway Age, No. 22, November 27, p. 762.

Bangor & Aroostook installs **lightweight coac** (2 000 words & fig.)

1937 **656 .1 (.**

Railway Age, No. 22, November 27, p. 765.

The Santa Fe's far-flung bus system. (1 400 wo & fig.)

1937 **62. (01 (.73) & 624 (.**

Railway Age, No. 23, December 4, p. 788.

SANDBERG (C. H.). — Design of **rigid-frame bri** checked by field tests. (2 200 words & fig.)

1937 **625 .23 (.73) & 656 .23 (.**

Railway Age, No. 23, December 4, p. 793.

The trend in passenger equipment. (4 400 words.)

37 **656 .224 (.73) & 656 .262 (.73)**
vay Age, No. 23, December 4, p. 797.
e New-Haven installs five **self-service grillcars.**
0 words & fig.)

Railway Engineering and Maintenance. (Chicago.)

37 **625 .173 (.73) & 665 .882 (.73)**
vay Engineering and Maintenance, Decemb., p. 894.
es **oxy-acetylene process to butt-weld rails in open** . (3 500 words & fig.)

37 **624. (0 (.73) & 625 .13 (.73)**
vay Engineering and Maintenance, Decemb., p. 898.
rought **iron again to the rescue.** (1 800 words .)

37 **625 .172 (.73)**
vay Engineering and Maintenance, Decemb., p. 902.
raightens **both line and surface-bent rails.** (1 300 s & fig.)

37 **621 .39 (.73) & 656 .253 (.73)**
vay Engineering and Maintenance, Decemb., p. 905.
ectric **switch lamps used on Santa Fe.** (1 400 words .)

Railway Gazette. (London.)

37 **656 .262 (.42)**
vay Gazette, No. 21, November 19, p. 871.
w **L. M. S. hotel** at Leeds. (2 500 words & fig.)

37 **656 .261 (.42)**
vay Gazette, No. 21, November 19, p. 878.
ilway **cartage and mechanical transport.** (2 800 s.)

37 **625 .232 & 656 .259**
vay Gazette, No. 22, November 26, p. 917.
IENER (L.). — Coming-of-age of the **Mitropa.**
0 words.)

37 **625 .143.5 (.42)**
vay Gazette, No. 22, November 26, p. 919.
effective sleeper fastening. (600 words & fig.)

37 **656 (.54)**
ay Gazette, No. 22, November 26, p. 920.
EELAND (Sir Henry F. E.). — Indian Railways heir competitors. (1 000 words.)

37 **621 .13 (09 (.436)**
ay Gazette, No. 22, November 26, p. 921.
RNER (E.). — A century of **steam traction** in ia. (1 700 words & fig.)

37 **625 .143.5 (.485)**
ay Gazette, No. 22, November 26, p. 925.
ew Swedish **fishbolt.** (250 words & fig.)

1937 **621 .132.3 (.42)**
Railway Gazette, No. 22, November 26, p. 926.
L. N. E. R. locomotive No. 10000, now in service, **rebuilt** as three-cylinder single-**expansion engine.** (1 200 words & fig.)

1937 **625 .143.3 (.42)**
Railway Gazette, No. 22, November 26, p. 928.
A new rail lubricator. (800 words & fig.)

1937 **526 & 625 .111**
Railway Gazette, No. 23, December 3, p. 978.
Tacheometric surveying in the railway yard. (1 400 words & fig.)

1937 **656 .253 (.62)**
Railway Gazette, No. 23, December 3, p. 980.
Modifications at Cairo station, Egyptian State Railways. **Re-arrangement of signalling.** (350 words & fig.)

1937 **625 .122 (.42)**
Railway Gazette, No. 23, December 3, p. 983.
Strenghtening of roadbed on clay formation for main line traffic. (700 words & fig.)

1937 **621 .94 (.42)**
Railway Gazette, No. 23, December 3, p. 984.
High-speed lathes in Crewe Works, L. M. S. R. (500 words & fig.)

1937 **625 .19 (.44) & 691 (.44)**
Railway Gazette, No. 23, December 3, p. 985.
A concrete-mixing train. (350 words & fig.)

1937 **621 .132.8 (.86)**
Railway Gazette, No. 23, December 3, p. 986.
Beyer-Garratt locomotives for the Dorada Railway. (1 000 words & fig.)

1937 **621 .132.3 (.62)**
Railway Gazette, No. 24, December 10, p. 1016.
New 4-4-0 type passenger locomotives for the Egyptian State Railways. (1 200 words & fig.)

1937 **625 .232 (.51) & 625 .234 (.51)**
Railway Gazette, No. 24, December 10, p. 1022.
First **air-conditioned coach,** Kowloon-Canton Railway, British section. (1 400 words & fig.)

1937 **621 .131.2 (.44) & 621 .131.3 (.44)**
Railway Gazette, No. 24, December 10, p. 1024.
Invisible streamlining of locomotives. (400 words & fig.)

1937 **621 .132.3 (.71)**
Railway Gazette, No 24, December 10, p. 1025.
New 4-4-4 locomotives, Canadian Pacific Railway. (300 words & fig.)

1937 **621 .9 (.42)**
Railway Gazette, No. 24, December 10, p. 1026.
The Richards patent axlebox-boring, facing, and radiusing machine. (900 words & fig.)

1937 **656 .25 (.51)**
Railway Gazette, No. 24, December 10, p. 1030.
Signalling on the Peiping-Liaoning Railway. (800 words.)

1937 **625 .1 (.493)**
Railway Gazette, No. 24, December 10, p. 1035.
The Brussels Nord-Midi Junction Railway. (700 words & fig.)

1937 **621 .43**
Diesel Railway Traction, p. 950, Supplt. to the Railway Gazette, November 26.
Ganz Diesel trains for the Central Argentine Railway. (2 300 words & fig.)

1937 **621 .43 (.435.9)**
Diesel Railway Traction, p. 955, Supplt. to the Railway Gazette, November 26.
Oil-engined railcars in Luxembourg. (400 words & fig.)

1937 **621 .43 (.42)**
Diesel Railway Traction, p. 956, Supplt. to the Railway Gazette, November 26.
A new principle in **Diesel shunting.** (600 words & fig.)

1937 **656 .252**
Diesel Railway Traction, p. 957, Supplt. to the Railway Gazette, November 26.
Railcar horns. (700 words & fig.)

1937 **621 .43**
Diesel Railway Traction, p. 959, Supplt. to the Railway Gazette, November 26.
Railcar oil engines. (3 000 words & fig.)

1937 **621 .335 (.494) & 621 .338 (.494)**
Electric Railway Traction, p. 1046, Supplt. to the Railway Gazette, December 10.
High speed electric trains in Switzerland. (1 900 words & fig.)

1937 **621 .33 (.44)**
Electric Railway Traction, p. 1050, Supplt. to the Railway Gazette, December 10.
P. O.-Midi railway electrification. (600 words.)

1937 **621 .333**
Electric Railway Traction, p. 1050, Supplt. to the Railway Gazette, December 10.
The dynamics of axle-hung motors. (300 words.)

Railway Magazine. (London.)

1937 **385. (091 (.42)**
Railway Magazine, No. 486, December, p. 393.
LEE (Ch. E.). — **The first steam railway.** (3 000 words & fig.)

1937 **656 .222.1 (.4)**
Railway Magazine, No. 486, December, p. 398.
European express trains in the summer of 1937 — II. (2 500 words & tables.)

1937 **656 .222.1 (.4**
Railway Magazine, No. 486, December, p. 404.
ALLEN (C. J.). — **British locomotive practice performance.** (5 100 words & fig.)

1937 **385. (091 (.49**
Railway Magazine, No. 486, December, p. 421.
WEBSTER (R.). — Impressions of the **Netherla Railways.** (2 800 words & fig.)

1937 **656 .25 (0 (.4**
Railway Magazine, No. 486, December, p. 430.
NOCK (O. S.). — The trend of **modern signalling** Great Britain. (5 700 words & fig.)

Railway Mechanical Engineer. (New York.)

1937 **621 .138.5 (.71) & 621 .43 (.7**
Railway Mechanical Engineer, No. 11, November, p.
SYLVESTER (I. I.). — **Maintenance of Diesel gines.** (8 400 words & fig.)

1937 **621 .246 & 669**
Railway Mechanical Engineer, No. 11, November, p.
STUEBING (A. F.). — Application in car consti tion of **high tensile steels.** (4 000 words.)

1937 **62. (01 & 621 .13**
Railway Mechanical Engineer, No. 11, November, p.
CALLAHAN (J. L.). — The effect on locomot boilers of **pitting and corrosion.** (2 000 words & fig.)

1937
Railway Mechanical Engineer, No. 11, November, p.
SILLCOX (L. K.). — Factors influencing the **fut of transportation.** (6 300 words & fig.)

1937 **621 .132.8 (.7**
Railway Mechanical Engineer, No. 11, November, p.
MICHAEL (L. P.). — Status of condensing **steam-turbine locomotives.** (2 500 words & fig.)

Railway Signaling. (Chicago.)

1937 **656 .256.2 (.**
Railway Signaling, November, p. 627.
New York Central installs first **button-control ro interlocking.** (4 500 words & fig.)

1937 **656 .259 (.**
Railway Signaling, November, p. 632.
Automatic interlocking replaces crossing ga (2 000 words & fig.)

1937 **625 .162 (.73) & 656 .259 (.**
Railway Signaling, November, p. 635.
HENRY (W.). — The efficiency of **crossing pro tion.** (7 000 words & fig.)

1937 **625 .162 (.73) & 656 .259 (.73)**
lway Signaling, November, p. 640.
Automatic gates on the Rock Island. (4 500 words ig.)

1937 **656 .258 (.73)**
lway Signaling, November, p. 646.
Iechanical plant replaced by single-lever interlock-. (2 200 words & fig.)

1937 **656 .258 (.71)**
lway Signaling, December, p. 687.
GEORGE (F.). — Signaling change on Canadian Pa-c. (1 400 words & fig.)

1937 **656 .254 (.73)**
lway Signaling, December, p. 690.
Pennsylvania C. T. C. installation. (2 300 words ig.)

1937 **656 .256.3 (.73) & 656 .258 (.73)**
lway Signaling, December, p. 694.
Block signals and automatic interlocking. (2 600 rds & fig.)

1937 **656 .253 (.73)**
lway Signaling, December, p. 698.
witch indicators serve as interlocking control de-es. (3 200 words & fig.)

1937 **656 .254 (.73)**
lway Signaling, December, p. 702.
Pocket train telephones. (2 600 words & fig.)

1937 **656 .259 (.73)**
lway Signaling, December, p. 706.
Three gate crossings in a row. (1 500 words & fig.)

The Locomotive. (London.)

1937 **621 .132.3 (.42)**
Locomotive, No. 544, December 15, p. 372.
Rebuilt engine No. 10000, L. N. E. R. (1 300 words ig.)

1937 **621 .132.3 (.481)**
Locomotive, No. 544, December 15, p. 374.
4-8-4 compound express locos., Norwegian State Rail-ys. (1 600 words & fig.)

1937 **621 .132.8 (.86)**
Locomotive, No. 544, December 15, p. 377.
Beyer-Garratt locos, Dorada Railway of Colombia. 00 words & fig.)

1937 **621 .43 (.42)**
Locomotive, No. 544, December 15, p. 379.
Diesel geared locomotive for steel works. (1 000 words g.)

1937 **625 .232 (.73)**
Locomotive, No. 544, December 15, p. 380.
Stainless steel trains. (1 600 words & fig.)

1937 **621 .333**
The Locomotive, No. 544, December 15, p. 382.
Institution of Locomotive Engineers. The hammer-blow with axle-hung electric traction motors. (600 words.)

1937 **621 .134.1**
The Locomotive, No. 544, December 15, p. 386.
Modern crank axle design. (2 400 words & tables.)

1937 **621 .88**
The Locomotive, No. 544, December 15, p. 390.
SANDERS (T. H.). — **The Belleville Washer spring.** (2 200 words & fig.)

1937 **621 .43**
The Locomotive, No. 544, December 15, p. 397.
Exhaust gas conditioner for Diesel locomotives. (2 000 words & fig.)

1937 **621 .133.8 (.42)**
The Locomotive, No. 544, December 15, p. 399.
Speedometers on the G. W. R. (300 words.)

The Oil Engine. (London.)

1937 **621 .43 (.73)**
The Oil Engine, No. 56, Mid-December, p. 238.
MANN (Ch. F. A.). — **5.400 b. h. p. diesel engines with two 600 b. h. p. auxiliaries;** a three-car set designed to haul a 14-coach train with an overall length of 1 296 ft. (1 500 words & fig.)

1937 **621 .43 (.42)**
The Oil Engine, No. 56, Mid-December, p. 242.
Diesel rail traction in Great Britain. (1 200 words.)

1937 **621 .43 (.42)**
The Oil Engine, No. 56, Mid-December, p. 253.
A directly reversible diesel locomotive. (700 words & fig.)

Transit Journal. (New York.)

1937 **621 .33 (.73) & 625 .26 (.73)**
Transit Journal, November, p. 448.
Maintenance on a « Wear » basis. (2 600 words & fig.)

1937 **621 .336 (.73)**
Transit Journal, November, p. 460.
BISHOP (G. E.). — **Speeds (overhead) wire installation.** (3 200 words & fig.)

1937 **625 .233 (.73)**
Transit Journal, December, p. 487.
BRADY (R. R.). — **Clean lamps-more light.** (700 words & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1937 **625 .113**

Annali dei lavori pubblici, settembre, p. 759.

UMILTA (M.). — Formule abbreviative per il **computo dei manufatti tipici stradali e ferroviari rastremati ed in curva.** (1 200 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1937 **669 .1**

Rivista tecnica delle ferrovie ital., 15 novembre, p. 301.

GUIDI (C.). — Il **torstahl.** (1 500 parole.)

1937 **624 .2 & 656 .211.5 (.45)**

Rivista tecnica delle ferrovie ital., 15 novembre, p. 314.

FAVA (A.). — Le **grandi travi** a due ginocchi della nuova stazione di Firenze S. M. N. (9 700 parole & fig.)

1937 **62. (01 & 625 .212**

Rivista tecnica delle ferrovie ital., 15 novembre, p. 343.

DUTTO (G.). — **Rottura di cerchioni** in servizio in relazione alla prova di resilienza e alla ricottura. (2 100 parole & fig.)

Trasporti e lavori pubblici. (Roma.)

1937 **656. (.45)**

Trasporti e lavori pubblici, ottobre, p. 316.

ZANETTE (C.). — **Reintegrazione dell' autotrasporto** ad opera delle ferrovie? (3 300 parole.)

In Dutch.

De Ingenieur. (Den Haag.)

1937 **62. (01 & 691**

De Ingenieur, No. 49, 3 December, p. Bt. 81.

ROEST VAN LIMBURG (A. E.). — **Bescherming van beton** tegen agressieve invloeden. (3 800 woorden & fig.)

1937 **656 .251 (.492) & 656 .253 (.49**

De Ingenieur, No. 50, 10 December, p. V. 89.

DE VOS VAN NEDERVEEN CAPPEL. — Cause over het **seinwezen** bij de Nederlandsche Spoorweg (7 500 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1937 **656 .1 (.49**

Spoor- en Tramwegen, No. 25, 7 December, p. 565.

De **regeling van het automobielvervoer** in Zwitsland. (1 800 woorden.)

1937 **385. (09 (.5**

Spoor- en Tramwegen, No. 25, 7 December, p. 567.

BERG (G. F.). — Indrukken van een reis naar **Japaansche Spoorwegen** (2 800 woorden & fig.)

1937 **621 .392 (.92) & 625 .143 (.9**

Spoor- en Tramwegen, No. 26, 21 December, p. 588.

VAN BERS (L. A.). — Het laden, vervoeren, loss en inleggen van **gelaschte spoorstaven** bij de N. Deli Spoorweg Maatschappij. (1 800 woorden & fig.)

1937 **385. (.7**

Spoor- en Tramwegen, No. 26, 21 December, p. 591.

PRINS (R.). — De wedergeboorte der **Amerikaanse spoorwegen.** (2 700 woorden & fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1937 **385. (.46**

Gazeta dos caminhos de ferro, No. 1199, 1 de dezembr p. 553.

de SOUZA (F.). — O **agrupamento dos nossos c minhos de ferro.** (2 400 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(MARS 1938)

16. 385. (02]

I. — BOOKS.

In French.

37 **624 .63**
ESTIER (V.).
lcul et exécution des ouvrages en béton armé. Tome
Ponts — Murs de soutènement — Barrages.
ris, Dunod. 1 volume, 246 pages. (Prix : 72 fr. fran-
)

37 **621 .392**
RNANT (E.) & ROSENTHAL (D.).
troduction à l'étude des soudures.
ris, Dunod, 92, rue Bonaparte. 1 brochure, 76 pages
figures. (Prix : 20 fr. français.)

38 **62. (02**
enda Béranger 1938.
ris et Liége, Librairie Polytechnique Ch. Béranger.
arnet de poche (9 × 14 cm.), 386 pages suivi d'un
da. (Prix : 22 fr. français.)

38 **621 .13 (02**
PELON (A.).
locomotive à vapeur.
is, J.-B. Baillière et fils. 1 volume, 914 pages, 363
es et 14 planches. (Prix : 350 fr. français.)

In German.

37 **621 .132.1(.43)**
Einheitslokomotiven der Deutschen Reichsbahn
ld.
lin, Technische Hochschule und Verkehrswissen-
tliche Lehrmittelgesellschaft m. b. H. 1 Band.
s : 1.80 R.M.)

37 **621 .138.5 (.43) & 625 .26 (.43)**
ners Taschenbuch für den Werkstätten- und Be-
maschinendienst bei der Deutschen Reichsbahn,

lin, Otto Elsner, Oranienstrasse, 140-142. 1 Band,
eiten. (Preis : 3.50 R.M.)

1937 **656**
FALLMANN (E.).
Die Lösung des Verkehrsproblems als Mittel zum Neuaufbau der Wirtschaft.
Leipzig und Wien, Franz Deutike. 1 Band, 280 Seiten. (Preis : 10 R.M.)

1937 **691**
GRÜN (R.).
Der Beton.
Berlin, Julius Springer. 1 Band, 498 Seiten, 90 Tabellen und 261 Bilderen. (Preis : 42 R.M.)

1937 **691. (02 & 721 .9 (02**
KERSTEN (C.).
Der Eisenbetonbau.
Berlin, Wilhelm Ernst & Sohn. 1 Band, 190 Seiten. (Preis : 5.50 R.M.)

1937 **625 .143.2**
LÜCKERATH (W.).
Über die Verbesserung von Stahlschienen durch Umgestaltung des Primärgefüges im Schienenfuss beim Walzen.
Berlin, Julius Springer, Linkstrasse 22-24. Band 1, Lieferung 6, 36 Seiten. (Preis : 4 R.M.).

In English.

1937 **385. (08 (.942)**
Annual report of the South Australian Railways Commissioner for the year 1936-37.
Adelaïde : Frank Trigg, Government Printer, North Terrace. 35 pages. No price stated.

1937 **621 .82 & 669**
BASSETT (H. N.).
Bearing metals and alloys.
London : Edward Arnold and Company. Price : 25 s. net.

1937 **621 .94**
COLVIN (F.-H.) and STANLEY (F.-A.). — Grinding practice.
London : McGraw-Hill Publishing Company, Ltd., Aldwyck House, W. C. 2. (Price 18 s. net.)

(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress intly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to vay Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 09).

1937 **669 .1**

Copper in cast steel and iron.

London : The Copper Development Association, Thomas House, Millbank, S. W. 1.

1937 **016. (.73)**

Current titles from Engineering Journals. Technology. Geology. Physics. Chemistry, No. 2, November.

New York : A. C. Stern, 928, Broadway. 92 pp. (Price : 30 cents.)

1938 **385. (08 (.54**

Eighty-fourth report of the directors of the Rohilkund & Kumaon Railway Company Limited, for the year ended 30th September, 1937.

London : The Rohilkund and Kumaon Railway Company, Ltd., 237, Gresham House, Old Broad Street, E. C. 19 pages. No price stated.

1938 **385. (08 (.54)**

Eighty-third report of the directors of the Bengal & North Western Railway Company, Limited, for the year ended 30th September, 1937.

London : The Bengal & North Western Railway Company, Ltd., 237, Gresham House, Old Broad Street, E.C. 2. A pamphlet of 22 pages. No price stated.

1937 **624**

FIFE (W. M.) and WILBUR (J.-B.).

Theory of statically indeterminate structures.

London : McGraw-Hill Publishing Company, Ltd., Aldwyck House W. C. 2. (Price : 21 s. net.)

1937 **385. (08 (.52)**

Government of Japan. Department of Railways. Annual report for the year ending March 31st, 1936.

Tokyo : The Toppan Press. No price stated.

1937 **669**

GREGORY (E.) and STEVENSON (W. W.).

Chemical analysis of metals and alloys.

London : Blackie and Son, Limited. (Price : 15 s. net.)

1937 **621 .132 (093 (.73)**

HENRY (R. S.).

Portraits of the Iron horse. Illustrated by Otto Kuhler.

Chicago : Rand Mc Nally & Co. (Price : 2 dollars.)

1937 **621 .165 (02**

KEARTON (Dr. W. J.).

Steam turbine operation. A textbook on the installation, running, maintenance and testing of steam turbines. Third edition.

London : Sir Isaac Pitman and Sons, Limited. (Price : 12 s. 6 d. net.)

1937 **621 .133.7**

Locomotive feed water.

London : Alfloc Ltd., Bush House, Aldwyck, W. C. 2. (Price : 3 s. 6 d. net.)

1937 **62**

McGRAE (R.).

Epicyclie gearing.

London : Draughtsman Publishing Company, 96, St. George's Square, S. W. 1 (Price : 2 s. net.)

1937 **62**

NASH (A. W.) and BOWEN (A. R.).

Principles and practice of lubrication. Second e

London : Chapman and Hall, Ltd, 11, Henrietta S W. C. 2. (Price : 18 s. net.)

1937 **621 .1**

PULL (E.).

Boiler house practice.

London : Technical Press, Ltd., 5, Ave Maria E. C. 4. (Price : 6 s. net.)

1937 **62**

PYE (D. R.).

The internal combustion engine. Second ed Vol. 1.

London : Oxford University Press, Amen House, wick square, E. C. 4. (Price : 15 s. net.)

1937 **6**

RAYMOND (W. G.).

The elements of **railroad engineering.**

New York : John Wiley and Sons, Incorporated.

London : Chapman and Hall, Limited. (Price : 6 d. net.)

1937 **385. (08**

Report of the General Manager of Railways and bours for the year endend 31st March, 1937.

Pretoria : Government Printing and Stationery fices. 242 pp. Illustrated. (Price : 7 s. 6 d.)

1937

SEVERNS (W. H.).

Heating, ventilating and air conditioning fundame

London : Chapman and Hall Ltd., 11, Henrietta S W. C. 2 (Price : 20 s. net.)

1937 **656 .2**

SHERRINGTON (C. E. R.).

The **economics of rail transport** in Great Br Vol. II. 2nd edition.

London : Edward Arnold and Co. (Price : 12 s net.)

1937 **385 .15**

SHORT (E.).

Railways and the State : the problem of nation tion.

London : The British Railway Stockholders Unio Victoria Street, S. W. 1. (9 in. × 6 in.) 56 pp. (P 1 s. net.)

7 62. (01)
SHENKO (S.).
ration problems in Engineering. Second edition.
don : Constable and Company, Limited. (Price :

8 656 .25 (.931)
ES (G. W.).
alling development on the New Zealand Govern-
Railways.
ding : The Institution of Railway Signal Engi-
A pamphlet of 17 pages. No price stated.

7 536
ANSKY (M. W.).
t and thermodynamics.
don : McGraw-Hill Publishing Company, Ltd.,
ych House, W. C. 2. (Price : 24 s. net.)

In Italian.

1937 **625.** (02
CORINI, Felice.
Scienza e tecnica delle costruzioni stradali. Tracciato-Corpo stradale-Sovrastrutture-Gallerie. Volume 1° : Del progetto.
Milano, Ulrico Hoepli. 1 volume, 855 pagine e figure.

In Portuguese.

1937 **385.** (08 (.68)
Administração dos serviços dos Portos, caminhos de ferro e transportes da Colónia de Moçambique.
Relatório do ano económico de 1934-35.
Lourenço Marquês. 846 páginas, tabelas e figuras.

16. 385. (05]

II. — PERIODICALS.

In French.

Annales des travaux publics de Belgique. (Bruxelles.)

7 62. (01
des travaux publics de Belgique, décembre, p. 885.
YOT (F.). — **Radiographie industrielle** par les
s gamma du radium. (22 500 mots & fig.)

Bulletin de l'Association française des amis des Chemins de fer. (Paris.)

8 621 .135. (01, 625.22 & 625.14 (01.
de l'Assoc. française des amis des ch. de fer, jan-
ier, p. 5.
UZIN. — La **stabilité des véhicules** sur les voies
s et la détermination des efforts qui s'exercent en-
ils et roues. (6 500 mots et fig.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

7 385 .62 & 385 .63
des transp. intern. par ch. de fer, décembre, p. 434.
igueur kilométrique des lignes auxquelles s'appli-
la **C. I. M.** et la **C. I. V.** du 23 octobre 1924. (Art.
). (1 200 mots.)

7 385 .63
les transp. intern. par ch. de fer, décembre, p. 439.
RTHEIMER (H.). — La signification des **disposi-**
tarifaires contenues dans les traités de commerce.
mots.)

1937 **313 .385 (.494)**
Bull. des transp. intern. par ch. de fer, décembre, p. 472.
Statistique des Chemins de fer fédéraux suisses pour 1936. (500 mots.)

Chronique des transports. (Paris.)

1937 **385 .113 (.44)**
Chronique des transports, n° 24, 25 décembre, p. 2.
Le **réseau de l'Etat français.** (1 300 mots.)

1938 **621 .132.8 (.44) & 621. 43 (.44)**
Chronique des transports, n° 1, 10 janvier, p. 11.
La première **locomotive Diesel électrique** française à grande puissance. (1 000 mots.)

Electricité. (Paris.)

1937 **621 .335 (.44)**
Electricité, décembre, p. 455.
NICOLET (V.) & NOUVION (F.). — Les nouvelles **automotrices rapides** de grande banlieue du Réseau de l'Etat (Electrification de la ligne Paris-Le Mans). (2 000 mots & fig.)

Génie civil. (Paris.)

1937 **691**
Génie civil, n° 2889, 25 décembre, p. 547.
L'influence de la température sur le **durcissement des bétons** de ciment. (1 500 mots.)

1937 **625 .216**
Génie civil, n° 2889, 25 décembre, p. 548.
L'application de l'**attelage automatique** aux wagons de chemins de fer européens. L'attelage « Compact-léger ». (2 300 mots & fig.)

1938 **625 .4 (.44)**

Génie civil, n° 2890, 1er janvier, p. 1; n° 2891, 8 janvier, p. 36; n° 2892, 15 janvier, p. 57.

BARDOUT (G.). — L'état actuel du réseau du **Chemin de fer métropolitain de Paris.** (11 700 mots & fig.)

1938 **621 .13 (.73)**

Génie civil, n° 2890, 1er janvier, p. 21.

La **locomotive à vapeur** aux Etats-Unis. (700 mots.)

1938 **656 .254**

Génie civil, n° 2890, 1er janvier, p. 40.

La répétition des **signaux de la voie** à bord des locomotives, par le système «Parisienne-Metrum» (P.A.M.). (3 000 mots & fig.)

1938 **625 .1 (.44)**

Génie civil, n° 2892, 15 janvier, p. 68.

La **nouvelle ligne** de Saint-Dié à Sainte-Marie-aux-Mines (Réseau d'Alsace et de Lorraine). (1 000 mots & fig.)

La Technique moderne. (Paris.)

1937 **624. (.44)**

La Technique moderne, n° 24, 15 décembre, p. 816.

LEVY (P.). — La **reconstruction du Pont du Carrousel** sur la Seine à Paris. (4 500 mots & fig.)

La Traction électrique. (Paris.)

1937 **621 .335 (.494)**

La Traction électrique, octobre, p. 145.

LEYVRAZ (L.). — **Automotrices légères,** série Ce 2/4, de la Compagnie du Chemin de fer des Alpes bernoises Berne-Loetschberg-Simplon. (3 200 mots & fig.)

1937 **621 .335 (.437)**

La Traction électrique, octobre, p. 151.

POSIK (V. V.). — **Locomotive électrique de manœuvre à accumulateurs** des Chemins de fer de l'Etat tchécoslovaque. (5 500 mots & fig.) (A suivre.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1937 **656 & 656 .232**

L'Industrie des voies ferrées et des transports automobiles, novembre, p. 274.

JOURDAIN (P.). — Comparaison des **prix de revient rail et route** pour 1935. (6 800 mots.)

1937 **526**

L'Industrie des voies ferrées et des transports automobiles, décembre, p. 296.

POIVILLIERS (G.). — Méthodes modernes de **levé des plans et des cartes.** (4 200 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1938 **621 .392 (.44) & 624.**

L'Ossature métallique, janvier, p. 21.

WIDMAN & MUCHERIE. — Construction d'un **sous rails** en charpente métallique soudée au-dess boulevard Ney, à Paris. (2 700 mots & fig.)

1938 **62. (01 & 621**

L'Ossature métallique, janvier, p. 29.

PATTON (E.-O.), GORBUNOV (B.-N.) & BERS (D.-I.). — Influence des tensions de retrait sur la **tance des constructions soudées.** (4 500 mots, 3 tab & fig.)

Revue générale des chemins de fer. (Pari

1938 **621 .135 (01, 625 .14 (01 & 6**

Revue générale des chemins de fer, janvier, p. 3.

MAUZIN. — Utilisation dans les chemins de fer **çais des appareils piézo-électriques pour la mesure forts.** (18 000 mots & fig.)

1938 **621 .131.3**

Revue générale des chemins de fer, janvier, p. 34.

MARTY (R.) & KAMMERER (A.). — Essais, au nel de St-Cyr, de deux **dispositifs de carénage** locomotives Pacific : carénage « Pottier » et dévi « Huet ». (7 700 mots & fig.)

1938 **621 .392 (.44) & 625 .242**

Revue générale des chemins de fer, janvier, p. 44.

HEINISCH. — Reconstruction aux ateliers de gnier du Réseau du Nord d'un **wagon tombereau** avec substitution à la caisse en bois d'une caisse m lique soudée. (1 000 mots & fig.)

1938 **621 .134.1**

Revue générale des chemins de fer, janvier, p. 52.

Bielles forgées pour locomotives. (1 700 mots &

1938 **625 .**

Revue générale des chemins de fer, janvier, p. 60.

L'**amélioration des rails en acier** par la transform de la macrostructure dans le patin au cours du lami (1 200 mots & fig.)

Revue universelle des Mines. (Liége.)

1938 **7**

Revue universelle des mines, janvier, p. 19.

VAN RUSSELT (H.). — Le **calcul des colonnes** les bâtiments industriels. (5 300 mots.)

Traction nouvelle. (Paris.)

1938 **621 .33**

Traction nouvelle, janvier-février, p. 2.

NICOLET (V.). — **Traction électrique** nouvelle Paris-Le Mans. (5 500 mots & fig.)

8 621 .43 (.56)
on nouvelle, janvier-février, p. 11.
autorails de Dietrich en Syrie. (1 200 mots & fig.)

8 621 .43 (.436)
on nouvelle, janvier-février, p. 18.
RNER (E.). — Les autorails des chemins de fer
aux autrichiens. (3 500 mots & fig.)

8 621 .43 (.493)
on nouvelle, janvier-février, p. 28.
NNIG (E.). — L'entretien des autorails à la
é nationale des Chemins de fer belges. (4 700 mots
)

8 621 .43
on nouvelle, janvier-février, p. 34.
ARDO (H. R.). — Le graissage des moteurs à
stion interne. (2 000 mots.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

7 656 .23
v für Eisenbahnwesen, Juli-August, S. 701.
ESS (W.). — Vom privaten und Selbstkostentarif
emeinwirtschaftlichen und Hoheits-Tarif. Hundert
Eisenbahntarifgeschichte. (10 300 Wörter.)

7 385. (.6)
v für Eisenbahnwesen, Juli-August, S. 729.
MY. — Die Zukunft des Schienenweges im gross-
nischen Verkehrsproblem. (15 000 Wörter.)

7 385 .113 (.438)
v für Eisenbahnwesen, Juli-August, S. 783.
Polnischen Staatseisenbahnen in den Jahren 1932
35. (10 000 Wörter.)

7 385 .113 (.481)
v für Eisenbahnwesen, Juli-August, S. 811.
SZKOWSKI (F.). — Die Entwicklung der Norwe-
n Staatsbahn unter besonderer Berücksichtigung
hre 1933-1935. (5 300 Wörter & Abb.)

7 385 .113 (.52)
v für Eisenbahnwesen, Juli-August, S. 829.
SSINOSSUKE OKADA. — Die Eisenbahnen in
in den Geschäftsjahren 1933 bis 1935. (5 000 Wör-

7 656. (.66)
v für Eisenbahnwesen, Juli-August, S. 851.
SCHEN (W.). — Die Eisenbahnen und die anderen
hrsmittel in Britisch-West-Afrika im Jahrfünft
1 — 1934-35. (4 500 Wörter, 7 Tabelle & Abb.)

7 656. (.66)
v für Eisenbahnwesen, Juli-August, S. 869.
icht über das Zusammenwirken der Verkehrsmittel
nia, Uganda und Tanganyka. (8 400 Wörter.)

1937 385 .113 (.43)
Archiv für Eisenbahnwesen, September-Oktober, S. 1043.
Die Leistungen der Deutschen Reichsbahn nach dem Geschäftsbericht 1936. (11 000 Wörter.)

1937 385 .517 (.43)
Archiv für Eisenbahnwesen, September-Oktober, S. 1077; November-Dezember, S. 1419.
KUHATSCHECK. — Die Reichsbahnversicherungsanstalt, die Reichsbahnbetriebskrankenkassen, die Angestellten-, Unfall- und Arbeitslosenversicherung bei der Deutschen Reichsbahn im Jahr 1936. (20 000 Wörter.)

1937 385 .113 (.42)
Archiv für Eisenbahnwesen, September-Oktober, S. 1101.
STUMPF (B.). — Die englischen Gruppenbahnen im Jahre 1936. Wirtschafts- und Betriebsergebnisse. (9 000 Wörter.)

1937 385 .113 (.494)
Archiv für Eisenbahnwesen, September-Oktober, S. 1131.
NITSCHKE. — Die Schweizerischen Bundesbahnen im Jahre 1936. (2 700 Wörter.)

1937 656. (.67)
Archiv für Eisenbahnwesen, September-Oktober, S. 1165.
PASCHEN (W.). — Die Eisenbahnen und die anderen Verkehrsmittel in Rhodesien. (7 600 Wörter.)

1937
Archiv für Eisenbahnwesen, Novemb.-Dezember, S. 1317.
RADERMACHER (P. P.). — Die Entwicklung von Schienenweg und Landstrasse in China. (11 400 Wörter.)

1937 656 .1 (.73)
Archiv für Eisenbahnwesen, Novemb.-Dezember, S. 1351.
BERCHTOLD (W.). — Die gesetzliche Regelung des Strassenverkehrs in den Vereinigten Staaten von Amerika. (25 000 Wörter.)

1937 385 .517 (.43)
Archiv für Eisenbahnwesen, Novemb.-Dezember, S. 1419.
WISCHNIAKOWSKY (B.). — Russische Verkehrsfragen. (15 000 Wörter & Abb.)

1937 385 .113 (.492)
Archiv für Eisenbahnwesen, Novemb.-Dezember, S. 1497.
OVERMANN. — Die Niederländischen Eisenbahnen im Jahre 1936. (6 500 Wörter.)

Die Lokomotive. (Wien.)

1937 621 .131.2
Die Locomotive, Dezember, S. 230.
HELMUT. — Die Beurteilung der Hauptabmessungen von Dampflokomotiven. (1 200 Wörter.)

1937 385. (.47)
Die Lokomotive, Dezember, S. 231.
Verbesserungen im russischen Eisenbahnbetrieb. (1 800 Wörter.)

1938 **621 .132.8 (.51)**
Die Lokomotive, Januar, S. 1.
2D2-Heissdampflokomotive für gemischten Dienst der Chinesischen Nationalbahn. (2 800 Wörter & Abb.)

1938 **621 .131.2 (.42)**
Die Lokomotive, Januar, S. 4.
STEFFAN. — Die neueren Grundlagen des **englischen Lokomotivbaues.** (3 300 Wörter.)

1938 **621 .132.3 (.439)**
Die Lokomotive, Januar, S. 8.
2B2-Stromlinien-Dampflokomotive Reihe 242 der kgl. ungarischen Staatseisenbahnen. (1 000 Wörter & Abb.)

Die Reichsbahn. (Berlin.)

1937 **656 .1 (.43)**
Die Reichsbahn, Heft 50, 15. Dezember, S. 1094.
REINHARDT. — 2 000 Kilometer **Reichsautobahnen.** (1 500 Wörter & Abb.)

1937 **656 .2 (.43)**
Die Reichsbahn, Heft 50, 15. Dezember, S. 1107.
SOMMERLATTE. — **Verkehrsspitzen** und verkehrliche Massnahmen zu ihrer Bewältigung. (9 500 Wörter.)

1937 **385. (.43)**
Die Reichsbahn, Heft 51, 22 Dezember, S. 1133.
BUSCH. — Der **Wirtschaftsplan** der Deutschen Reichsbahn. (11 000 Wörter.)

1937 **385. (07 (.42 + .43)**
Die Reichsbahn, Heft 52, 29. Dezember, S. 1159.
MÜLLER-HILLEBRAND. — Deutsch-englische Zusammenarbeit im **Eisenbahnfilm.** (1 500 Wörter.)

1937 **385 .517 (.43)**
Die Reichsbahn, Heft 52, 29. Dezember, S. 1162.
JAISSER. — Der **Reichsbahn-Waisenhort.** Zweck und Aufgaben der Stiftung. (2 300 Wörter & Abb.)

1938 **385. (09 (.43) & 385 .113 (.43)**
Die Reichsbahn, Heft 1, 5. Januar, S. 4.
Die **Deutsche Reichsbahn** im Jahre 1937. (33 000 Wörter.)

1938 **625 .4 (.43)**
Die Reichsbahn, Heft 2, 12. Januar, S. 58.
GRABSKI. — Vom **Bau der Berliner Nordsüd-S-Bahn.** (1 800 Wörter & Abb.)

Elektrische Bahnen. (Berlin.)

1937 **621 .335**
Elektrische Bahnen, Heft 11, November, S. 255.
SCHMER (K.). — Vergleich zwischen **Lokomotiv- und Triebwagenbetrieb im elektrischen Fernschnellverkehr.** (3 200 Wörter & Abb.)

1937 **621 .392 & 62**
Elektrische Bahnen, Heft 11, November, S. 261.
REITER. — Die schweisstechnische Gestaltung **Bau von Eisenbahnfahrzeugen.** (5 300 Wörter & A

1937 **621 .335 (.4**
Elektrische Bahnen, Heft 11, November, S. 270.
LIECHTY (R.). — **Neuer Triebwagen** der Be Alpenbahn. (700 Wörter & Abb.)

1937 **621 .335 (**
Elektrische Bahnen, Heft 11, November, S. 279.
TRÜBENBACH (E.). — Der **Wechselstrom-Aussic triebwagen.** (2 000 Wörter & Abb.)

1937 **621 .43 (.**
Elektrische Bahnen, Heft 11, November, S. 285.
ACHENBACH (W.) & KREUTER (E.). — **Di elektrische Verschiebelokomotive** 185 PS. (3 200 W & Abb.)

1937 **621**
Elektrische Bahnen, Heft 11, November, S. 289.
RÖDIGER (W.). — **Startdauer und Anfahrbeschle gung.** (1 100 Wörter & Abb.)

1937 **625**
Elektrische Bahnen, Heft 11, November, S. 291.
VOIGTLÄNDER (H.). — Ein Beitrag zur Frage **Bremsung elektrischer Lokomotiven** aus Höch schwindigkeiten. (1 800 Wörter.)

1937 **621**
Elektrische Bahnen, Heft 12, Dezember, S. 297.
KOTHER (H.). — Fahrzeitermittlung und Bes mung der Beanspruchung der Fahrmotoren und Transformators **elektrischer Triebfahrzeuge.** (Wörter, 7 Tafeln & Abb.)

Glasers Annalen. (Berlin.)

1937 **621 .131.3 (**
Glasers Annalen, Heft 11, 1. Dezember, S. 169.
WEBER (W.). — **Messwagen zur Untersuchung Dampflokomotiven** mit besonderer Berücksichtigung deutschen Ausführungen. (9 300 Wörter & Abb.)

1937 **621 .132.8 & 62**
Glasers Annalen, Heft 11, 1. Dezember, S. 179.
SCHRADER. — Die **Diesellokomotive** mit unmitt rem Antrieb. (3 300 Wörter & Abb.)

1937 **621 .392 (**
Glasers Annalen, Heft 11, 1. Dezember, S. 184.
STIELER (C.). — Die **Schweisstechnik** im Vierja plan. (5 300 Wörter & Abb.)

1937 **625 .**
Glasers Annalen, Heft 11, 1. Dezember, S. 192.
MÜLLER (O.). — Notwendigkeit und Wirtschaf keit der Verwendung **maschineller Hilfsmittel bei Arbeiten am Oberbau.** (5 500 Wörter.)

7 **621 .133 (01**
's Annalen, Heft 12, 15. Dezember, S. 197.
LTE. — Über die Beurteilung von Wassergehalten mpf (1 — ×) Verdampfungsziffern z_w und Kes-kungsgraden (η_w) bei **Heissdampflokomotiven** auf etischer und praktischer Grundlage. (4 700 Wör-

7 **625 .214**
's Annalen, Heft 12, 15. Dezember, S. 204.
BEL & NAGEL. — Vorsetzgehäuse mit **mechani-Schmierölförderung für Wagenachslager.** (1 400 er & Abb.)

8 **385. (06.4 (.44)**
's Annalen, Heft 1, 1. Januar, S. 1.
HEES (H.). — Die **Eisenbahnfahrzeuge** auf der er Weltausstellung 1937. (4 800 Wörter & Abb.)

n für die Fortschritte des Eisenbahnwesens. (Berlin.)

8 **385. (09.3 (.436)**
für die Fortschr. des Eisenbahnw., Heft 1, . Januar, S. 1.
OSS. — Zur **Jahrhundertfeier** der **Österreichischen feisenbahnen.** (1 400 Wörter & Abb.)

8 **621 .13 (09 (.436)**
für die Fortschr. des Eisenbahnw., Heft 1, . Januar, S. 6.
HNER (A.). — **Hundert Jahre österreichischer Lo-tivbau.** (3 300 Wörter & Abb.)

8 **621 .33 (.492)**
für die Fortschr. des Eisenbahnw., Heft 1, . Januar, S. 13.
PERUS (J. L. A.). — Gründung der Maste der **rischen Oberleitung** bei den Niederländischen Eisen-n. (3 300 Wörter & Abb.)

8 **385. (06.4 (.44)**
für die Fortschr. des Eisenbahnw., Heft 2, 5. Januar, S. 19.
SSEN (H.). — Die **Eisenbahnfahrzeuge** auf der nationalen Ausstellung in Paris 1937. (17 000 Wör- Abb.)

schrift des Vereines deutscher Ingenieure (Berlin.)

8 **621 .43**
h. des Ver. deutsch. Ing., Nr. 1, 1. Januar, S. 9.
NER (K.). — Gemischbildung, Verbrennungs- f und Wirkungsgrad beim **schnellaufenden Diesel-**. (4 000 Wörter & Abb.)

8 **621 .131.2**
h. des Ver. deutsch. Ing., Nr. 1, 1. Januar, S. 17.
UCK (P.). — Entwicklungsmerkmale im **Dampf-otivbau.** (4 200 Wörter & Abb.)

1938 **62. (01**
Zeitsch. des Ver. deutsch. Ing., Nr. 1, 1. Januar, S. 28.
Werkstoffprüfung mit Röntgenstrahlen und mittels magnetischer Verfahren. (1 300 Wörter.)

1938 **656 .225 & 656 .261**
Zeitsch. des Ver. deutsch. Ing., Nr. 1, 1. Januar, S. 29.
KRUMMEL (H.). — Die Wirtschaftlichkeit des **Kleinbehälterverkehrs.** (1 100 Wörter.)

1938 **621 .392 & 624**
Zeitschr. des Ver. deutsch. Ing., Nr. 2, 8. Januar, S. 33.
BRÜCKNER (K.). — Erfahrungen mit dem **Schweissen von Eisenbahnbrücken.** (7 500 Wörter & Abb.)

1938 **536**
Zeitschr. des Ver. deutsch. Ing., Nr. 2, 8. Januar, S. 49.
SCHMIDT (E.). — **Gemeinschaftsarbeit in der Wasserdampfforschung.** Die VDI-Wasserdampftafeln. (2 700 Wörter & Abb.)

1938 **62. (01**
Zeitschr. des Ver. deutsch. Ing., Nr. 2, 8. Januar, S. 51.
Arbeiten zur Vereinheitlichung der **Werkstoffprüfung.** (700 Wörter.)

1938 **656 .1 (.43)**
Zeitschr. des Ver. deutsch. Ing., Nr. 3, 15. Januar, S. 73.
SEIDEL (H.). — 2 000 Km. fertige **Kraftfahrbahnen.** (1 800 Wörter & Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungs- und Fernmeldewesen. (Berlin.)

1937 **656 .256**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 16, 10. Dezember, S. 202.
BUDDENBERG (A.). — **Schienenstromschliesser.** (1 000 Wörter & Abb.)

1938 **656 .256**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 1, 10. Januar, S. 4.
NITSCHKE. — Die **Streckenblockung** auf eingleisigen Bahnen. (2 900 Wörter & Abb.) (Fortsetzung folgt).

1938 **656 .253**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 1, 10. Januar, S. 8.
SCHMITZ (W.). — Die Entwicklung der **Lichttages-signal-Schaltungen.** (5 300 Wörter & Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1938 **385. (.4)**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 1, 6. Januar, S. 1; Nr. 2, 13. Januar, S. 25; Nr. 3, 20. Januar, S. 53.
Rückblick auf das Jahr 1937 (60 400 Wörter.) (Schluss folgt.)

1938 **621 .135.4 & 625 .215**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 52, 30. Dezember, S. 943.

SCHWANCK (U.). — Der Einfluss **kurvenschneller Eisenbahnfahrzeuge** auf die Betriebsführung der Eisenbahnen. (3 700 Wörter, 2 Zahlentafeln & Abb.)

In English.

Bulletin, American Railway Engineering Association. (Chicago.)

1937 **625 .1 (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 177.

Report of Committee XII — Rules and organization (Revision of manual : rail-distribution and handling; renewals, etc.; Rules for welding of frogs, etc.) (3 300 words.)

1937 **614. (.73) & 621 .133.7 (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 187.

Report of Committee XIII — **Water service, fire protection and sanitation.** (13 500 words.)

1937 **656 .21 (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 219.

Report of Committee XIV — **Yards and terminals.** (14 000 words.)

1937 **621 .138 (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 255.

Report of Committee XXIII — **Shops and locomotive terminals.** (3 500 words & fig.)

1937 **691. (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 265.

Report of Committee XVII — **Wood preservation.** (10 000 words & fig.)

1937 **347 .75 (.73)**
Bulletin, Amer. Railway Engineering Assoc., No. 400, December, p. 307.

Report of Committee XX — **Uniform general contract forms.** (3 500 words.)

Engineer. (London.)

1937 **621 .116**
Engineer, No. 4275, December 17, p. 680.

DOWSON (R.). — Performance of **single-stage steam jet operated ejectors.** (3 000 words & fig.)

1937 **621 .43 (.82)**
Engineer, No. 4275, December 17, p. 682.

Railcars for the Buenos Aires Pacific Railway Company. (1 800 words & fig.)

1937 **621 .132.3 (.7**
Engineer, No. 4275, December 17, p. 684.

New American streamlined locomotives. (1 300 word

1937 **62. (09**
Engineer, No. 4275, December 17, p. 688.

TOOKEY (W. A.). — **A half-century of engineer progress.** (3 500 words.)

1937 **385. (**
Engineer, No. 4275, December 17, p. 694.

An old railway manual. (4 700 words.)

1937 **621 .33 (.4**
Engineer, No. 4275, December 17, p. 696.

Electrification of the Paris-Orleans and Midi Ra ways. (1 800 words.)

1937 **621**
Engineer, No. 4276, December 24, p. 711.

TOWLER (F. H.). — Recent developments in **hi speed reciprocating pumps.** (3 100 words & fig.)

1937 **621**
Engineer, No. 4277, December 31, p. 733.

DAVID (W. T.). — **Turbulence in internal combust engines.** (1 200 words & fig.)

1937 **621 .337 (.4**
Engineer, No. 4277, December 31, p. 750.

A new control system for electric motor coac (600 words & fig.)

1937 **621 .39 & 669**
Engineer, No. 4277, December 31, p. 751.

STOBIE (V.). — **Refining steel in the high-freque furnace.** (3 200 words & fig.)

1938 **624, 625 .7 & 625**
Engineer, No. 4278, January 7, p. 9.

Roads, bridges and tunnels in 1937. (5 100 word fig.)

1938 **62 (064 (.**
Engineer, No. 4728, January 7, p. 13.

The Physical Society's exhibition. (5 600 words &

1938 **621 .13 & 625**
Engineer, No. 4278, January 7, p. 27.

Locomotives and trains of 1937. (4 600 words &

1938 **62**
Engineer, No. 4278, January 7, p. 30 and No. January 14, p. 44.

Electrical engineering in 1937. (11 400 words & fig

1938 **621**
Engineer, No. 4279, January 14, p. 38.

Oil-engined rail traction in 1937. (3 400 words &

37 **62.** (01
Metallurgist, p. 86, Supplt. to the Engineer, December 31.
SOMEREN (E. H. S.). — Recent German advances **ectographic analysis.** (2 200 words.)

37 **669 .1**
Metallurgist, p. 88, Supplt. to the Engineer, December 31.
gnetic properties of nickel-copper-iron alloys. 0 words & fig.)

37 **669 .1**
Metallurgist, p. 90, Supplt. to the Engineer, December 31.
se hardening of 14 per cent. Chromium steels. 1 200 s & fig.)

37 **625 .143.2 & 625 .143.3**
Metallurgist, p. 92, Supplt. to the Engineer, December 31.
sures in railroad rails. (1 900 words.)

Engineering. (London.)

37 **62.** (01 & **621 .6**
neering, No. 3753, December 17, p. 674.
ILEY (R. W.). — **Flanged pipe joints for high ures and temperatures.** (3 500 words & fig.)

37 **656 .222.1 (.44)**
neering, No. 3753, December 17, p. 676 and No. 3755, December 31, p 733.
NKSWELL (Lord). — **Railway runs in France,** (7 500 words & fig.)

37 **621 .33 (.44)**
neering, No. 3753, December 17, p. 702.
ctrification of the Paris-Orléans and Midi Rail- (1 200 words.)

37 **621 .6**
neering, No. 3754, December 24, p. 725.
WLER (F. H.) and TOWLER (J. M.). — Recent **opments in high-speed reciprocating pumps.** (Paper before the Institution of Mechanical Engineers. ged.) (5 700 words & fig.)

37 **621 .82 & 621 .89**
neer, No. 3755, December 31, p. 757.
AW (H.). — **Metal-sprayed surfaces in relation to ation.** (3 600 words.)

38 **621 .43**
neer, No. 3756, January 7, p. 4.
NCHESTER (F. W.). — **The energy balance sheet e gas engine.** (2 600 words.)

38 **621 .43 (.42)**
neer, No. 3756, January 7, p. 7.
ivy oil locomotive for underground work. (500 .)

1938 **621 .43 (.82)**
Engineering, No. 3756, January 7, p. 11.
KIMBERLEY (R. E.). — **240-h. p. diesel railcar** for the Buenos Aires and Pacific Railway. (1 600 words & fig.)

1938 **62. (064 (.42)**
Engineering, No. 3736, January 7, p. 19.
The Physical Society's exhibition. (5 300 words & fig.)

Engineering News-Record. (New York.)

1937 **721**
Engineering News-Record, No. 24, December 9, p. 925.
BOWMAN (W. G.). — **Buildings that express new trends.** An introduction to a series of 6 articles on modern buildings (Twenty-seven forms of glass. Masonry gives way to steel. More space, more light, more efficiency. School without windows. Parking on the roof. Concrete improves its appearance, etc.). (24 000 words & fig.)

1937 **624 .8 (.73)**
Engineering News-Record, No. 26, December 23, p. 1016.
Motana's swingbridge. (1 200 words & fig.)

1937 **721 .1 (.73**
Engineering News-Record, No. 27, December 30, p. 1045.
Piledriving in debris fill. (3 800 words & fig.)

1938 **627 .82 (.73) & 721 .1 (.73)**
Engineering News-Record, No. 1, January 6, p. 15.
Grouting under an earth dam. (4 900 words & fig.)

1938 **625 .13 (.73)**
Engineering News-Record, No. 1, January 6, p. 20.
High timber falsework units. (1 200 words & fig.)

1938 **721 .1**
Engineering News-Record, No. 1, January 6, p. 23.
NEWMARK (N. M.). — **Estimating earth pressures.** (1 000 words & fig.)

Journal, Institute of Transport. (London.)

1938 **656**
Journal, Institute of Transport, No. 3, January, p. 112.
GUPWELL (L. W.). — **Co-ordination of inland transport (goods).** (6 300 words.)

Journal, Institution of Civil Engineers. (London.)

1938 **625 .13 (.42)**
Journal, Institution of Civil Engineers, January, p. 383.
The reconstruction of Chelsea Bridge. (27 000 words & fig.)

1938 , **624 .2**
Journal, Institution of Civil Engineers, January, p. 447.
An application of the **principle of superposition to certain structural problems.** (4 200 words.)

Journal, Institution of Engineers, Australia. (Sydney, N. S. W.)

1937 **654**

Journal, Institution of Ingineers, Australia, No. 11, November, p. 423.

PAGE (R. E.). — **Inductive interference in telephone circuits.** (13 800 words & fig.)

Mechanical Engineering. (New York.)

1938 **621** .335 & **621** .43

Mechanical Engineering, No. 1, January, p. 22.

Progress in railroad mechanical engineering in 1937 — Part II. Diesel and electric developments. New car designs. (6 700 words & fig.)

1938 **621** .392

Mechanical Engineering, No. 1, January, p. 37.

BRINTON (C. C.). — **Development in welding large structures.** (2 900 words & fig.)

Modern Transport. (London.)

1937 **621** .132.3 (.54)

Modern Transport, No. 979, December 18, p. 4.

Experimental passenger locomotives. 1 000 words.)

1937 **625** .656 (.42) & **625** .617 (.42)

Modern Transport, No. 979, December 18, p. 5.

New rolling stock for Kent Light Railway. (1 700 words & fig.)

1937 **621** .43 (.73) & **621** .33 (.73)

Modern Transport, No. 980, December 25, p. 3.

Road-rail vehicles replace electric trains. (1 300 words & fig.)

1937 **656** .29 (.43)

Modern Transport, No. 980, December 25, p. 4.

Production of railway films. (1 100 words.)

1937 **656.** (.7)

Modern Transport, No. 980, December 25, p. 4.

Transport in Latin America. (800 words.)

1938 **347** .763 (.42)

Modern Transport, No. 981, January 1, p. 3.

Impending legislation on transport. (2 400 words.)

1938 **656.** (.42)

Modern Transport, No. 981, January 1, p. 4.

Passenger transport problems. (1 000 words.)

1938 **656** .254 (.42)

Modern Transport, No. 981, January 1, p. 5.

Train and traffic control on L. N. E. R. (1 300 words & fig.)

1938 **614.** (.43) & **625** .28 (.43)

Modern Transport, No. 981, January 1, p. 13.

STRAUSS (F.). — **Accident procedure on German Railways.** (1 500 words & fig.)

1938 **621** .43 (.8

Modern Transport, No. 982, January 8, p. 3.

Diesel-engined railcar developments in Argenti (3 000 words & fig.)

1938 **621** .335 (.931) & **621** .338 (.93

Modern Transport, No. 982, January 8, p. 7.

Electric rolling stock for New Zealand. (3 300 wo & fig.)

1938 **625** .4 (.4

Modern Transport, No. 982, January 8, p. 9.

Underground Railways of Paris. (1 600 words & fi

1938 **621** .3

Modern Transport, No. 982, January 8, p. 13.

Arc welding in transport. (1 700 words & fig.)

1938 **656.** (.4

Modern Transport, No. 983, January 15, p. 3.

Transport in Northern Ireland. (1 800 words.)

1938 **656** .253 (.4

Modern Transport, No. 983, January 15, p. 4.

Colour light signals equipment in southern area the L. N. E. R. Several cabins closed. (700 words.)

1938 **621** .132.3 (.7

Modern Transport, No. 983, January 15, p. 4.

New C. P. R. locomotive. Streamlined unit with duced weight. Economy in operation. (600 words & fi

1938 **388.** (.4

Modern Transport, No. 983, January 15, p. 5.

Passenger transport in outer London. (1 800 words.

1938 **456.** (.4

Modern Transport, No. 983, January 15, p. 7.

Transport co-ordination. (2 200 words.)

1938 **621** .335 (.4

Modern Transport, No. 983, January 15, p. 9.

Battery locomotives for London Transport. (1 words & fig.)

Proceedings, American Society of Civil Engineers. (New York.)

1937 **621.**

Proc., Amer. Soc. Civil Eng., No. 10, December, p. 1

Economic aspects of energy generation; a symposi Progress in the generation of energy by heat engi Hydro-generation of energy. Improvements in the lization of energy. Cost of generation of electric ene Social implications of technological trends in the po industry. Electric power in economic perspective. (25 words & fig.)

1937 **385**

Proc., Amer. Soc. Civil Eng., No. 10, December, p. 1

Water transportation versus rail transportation symposium. (1 100 words.)

Railway Age. (New York.)

7 **621** .132.3 (.73) & **625** .232 (.73)
ay Age, No. 24, December 11, p. 826.
ding receives **lightweight streamline train.** (3 800
& fig.)

---

7 **625** .143.4 (.73)
ay Age, No. 24, December 11, p. 834.
l joint tests now in progress. (1 000 words & fig.)

---

7 **625** .162 (.73) & **656** .259
ay Age, No. 24, December 11, p. 835.
NRY (W.). — **Efficiency of crossing protection.**
) words & fig.)

---

7 **621** .43 (.73)
ay Age, No. 25, December 18, p. 868.
rgest Diesel locomotives for Chicago-to-Coast ser-
(2 800 words & fig.)

---

7 **313 : 621** .139 (.73), **313 : 625** .18 (.73)
& **313 : 625** .27 (.73)
ay Age, No. 25, December 18, p. 877.
ying survey yields data on railway needs. (1 300
& fig.)

---

7 **624.** (.73)
ay Age, No. 25, December 18, p. 881.
e concrete pile trestle in L. & N. grade separation.
) words & fig.)

---

7 **621** 132.3 (.73) & **625** .232 (.73)
ay Age, No. 26, December 25, p. 902.
timore & Ohio installs **new Royal Blue train.**
) words & fig.)

---

7 **656** .222.1 (.73)
ay Age, No. 26, December 25, p. 907.
ta Fe locomotive makes record run. (1 000 words.)

---

7 **656** .213 (.73)
ay Age, No. 26, December 25, p. 911.
ectional flood-lighting solves crossing problem
) words & fig.)

---

7 **624.** (0
ay Age, No. 26, December 25, p. 913.
eam-Lok open floor. (500 words & fig.)

---

7 **656** .1 (.73)
ay Age, No. 26, December 25, p. 914.
P. builds **truck-bus system.** (1 300 words & fig.)

---

7 **656.** (.8)
ay Age, No. 26, December 25, p. 920.
sual rail-highway co-ordination. (300 words.)

---

8 **313 : 621** .13 (.73
ay Age, No. 1, January 1, p. 10.
railroads need new engines. (1 200 words & fig.)

1938 **313 : 625.** (.73
Railway Age, No. 1, January 1, p. 12.
Freight-car demand accelerated by two factors. (1 100
words & fig.)

1938 **625** .23 (0 (.73)
Railway Age, No. 1, January 1, p. 14.
Passenger service in a new era. (1 100 words & fig.)

1938 **621** .9 (.73)
Railway Age, No. 1, January 1, p. 16.
New machine tools greatest need in **shop equipment.**
(1 600 words & fig.)

1938 **625** .1 (.73)
Railway Age, No. 1, January 1, p. 18.
Railway construction — **a pressing need.** (2 000 words
& fig.)

1938 **625** .144 (.73)
Railway Age, No. 1, January 1, p. 20.
Work equipment — a door to economy. (1 500 words
& fig.)

1938 **313 : 625** .17 (.73)
Railway Age, No. 1, January 1, p. 22.
A billion Dollars behind in **maintenance of way and**
structures. (1 700 words & fig.)

1938 **313 : 621** .43 (.73) & **313 : 625** .232 (.73)
Railway Age, No. 1, January 1, p. 25.
Trains cost money. (800 words.)

1938 **385.** (08 (.73)
Railway Age, No. 1, January 1, p. 30.
PARMELEE (J. H.). — **A review of railway oper-**
ations in 1937. (12 200 words.)

1938 **385** .1 (.71)
Railway Age, No. 1, January 1, p. 41.
Canadian roads have fair year. (2 000 words.)

1938 **385** .1 (.72)
Railway Age, No. 1, January 1, p. 43.
Mexican railways' traffic at Peak. (1 800 words.)

1938 **385** .113 (.73)
Railway Age, No. 1, January 1, p. 45.
LYNE (J. G.). — **Railway finances do a nose dive**
(1937). (3 000 words.)

1938 **313 : 621** .139 (.73), **313 : 625** .27 (.73)
& **313 : 625** .18 (.73)
Railway Age, No. 1, January 1, p. 53.
STEEL (D. A.). — **Railway buying loses momentum.**
(2 800 words.)

1938 **313 : 625** .1 (.73)
Railway Age, No. 1, January 1, p. 65.
BOYD (G. E.). — **Railway construction remains low.**
(9 500 words.)

1938 **313 : 621 .13 (.73) & 313 : 621 .43 (.73)**
Railway Age, No. 1, January 1, p. 76.
SCHMIDT (W. H.). — **Locomotives ordered in 1937.** (3 200 words.)

1938 **313 : 625 .24 (.73)**
Railway Age, No. 1, January 1, p. 80.
KRAEGER (F. W.). — **Freight cars ordered in 1937.** (3 900 words.)

1938 **313 : 625 .23 (.73)**
Railway Age, No. 1, January 1, p. 85.
KRAEGER (F. W.). — **Passenger train cars ordered in 1937.** (1 500 words.)

1938 **313 : 656 .25 (.73)**
Railway Age, No. 1, January 1, p. 88.
DUNN (J. H.). — **Signaling construction increased in 1937.** (3 600 words.)

1938 **313 : 656 .1 (.73)**
Railway Age, No. 1, January 1, p. 95.
LAYNG (Ch.). — **Motor transport operations continue to grow.** (3 100 words.)

1938 **621 .132.5 (.73)**
Railway Age, No. 2, January 8, p. 113.
Heavy freight power for K. C. S. (1 300 words & fig.)

1938 **621 .137.1 (.73)**
Railway Age, No. 2, January 8, p. 115.
I. C. C. issues stoker order. (1 000 words.)

1938 **385 .3 (08 (.73)**
Railway Age, No. 2, January 8, p. 118.
Annual report of the I. C. C. (3 600 words.)

1938 **656 .254 (.73) & 656 .255 (.73)**
Railway Age, No. 2, January 8, p. 122.
C. T. C. increases capacity of single-track. (1 600 words & fig.)

1938 **656 .26 (.73)**
Railway Age, No. 2, January 8, p. 124.
Provides special facilities for servicing « daylight » trains. (1 500 words & fig.)

Railway Engineering and Maintenance. (Chicago.)

1938 **313 : 625 .144.4 (.73)**
Railway Engineering and Maintenance, January, p. 24.
$ 5 000 000 for work equipment. (4 000 words & fig.)

1938 **625 .172**
Railway Engineering and Maintenance, January, p. 36.
What causes soft spots in the roadbed ? (1 400 words.)

Railway Gazette. (London.)

1937 **625 .1 (.7**
Railway Gazette, No. 25, December 17, p. 1163.
Rebuilding the Moffat Railroad, U. S. A. (1 000 wor & fig.)

1937 **385 .4 (.4**
Railway Gazette, No. 25, December 17, p. 1165.
Divisional Administration on French State Railway (500 words & fig.)

1937 **656 .1 (.4**
Railway Gazette, No. 25, December 17, p. 1173.
G. N. R. road services in the Irish Free State. (1 3 words & fig.)

1937 **656 .261 (.4**
Railway Gazette, No. 25, December 17, p. 1177.
L. M. S. R. horses. (1 200 words & fig.)

1937 **656 .1 (.4**
Railway Gazette, No. 25, December 17, p. 1179.
Progress of the Reichsautobahnen. (1 000 words & fi

1937 **385. (09 (.9**
Railway Gazette, No. 25, December 17, p. 1181.
The Federated Malay States Railways. (1 800 wor & fig.)

1937 **385. (.72**
Railway Gazette, No. 26, December 24, p. 1203.
The Jamaica Government Railway. (1 600 words.)

1937 **625 .232 (.4**
Railway Gazette, No. 26, December 24, p. 1205.
New lightweight suburban coaches for the East Railways of France. (600 words & fig.)

1937 **621 .132.6 (.4**
Railway Gazette, No. 26 December 24, p. 1210.
Streamlined tank locomotives for double-deck sub ban trains, Lübeck-Büchen Railway. (1 000 words & fi

---

1937 **721 .31 (.6**
Railway Gazette, No. 26, December 24, p. 1212.
Station design on the Egyptian State Railways. (1 words & fig.)

1937 **656 .254 (.4**
Railway Gazette, No. 27, December 31, p. 1249.
Extension of train and traffic control, L. N. E. (1 400 words.)

1937 **656 .253 (.54) & 656 .258 (.**
Railway Gazette, No. 27, December 31, p. 1251.
Power signalling at Howrah, East Indian Railw (2 400 words & fig.)

1937 **625 .232 (.**
Railway Gazette, No. 27, December 31, p. 1256.
New main-line coaches, Great Southern Railways. words.)

37 **621 .34 (.42)**
way Gazette, No. 27, December 31, p. 1257.
ctional steel poles. (1 300 words & fig.)

---

38 **621 .132.5 (.68)**
way Gazette, No. 1, January 7, p. 16.
perimental 2-10-4 locomotive for the South African
ways. (1 200 words & fig.)

---

38 **621 .134.2 & 621 .9**
way Gazette, No. 1, January 7, p. 18.
interesting locomotive valve-setting machine. (400
s & fig.)

---

38 **62. (01**
way Gazette, No. 1, January 7, p. 19.
ALMONY (A.). — Modern microscopy in railway
. (1 200 words & fig.)

---

38 **656 .212.6 (.42)**
way Gazette, No. 1, January 7, p. 22.
new design of steam crane. (900 words & fig.)

---

38 **385 .4 (.44)**
way Gazette, No. 1, January 7, p. 30.
ench National Railways organisation. (800 words.)

---

38 **656 .222 .1 (.42)**
way Gazette, No. 1, January 7, p. 32.
odern 4-4-0 locomotive performance (1 500 words &

---

38 **621 .134.5 (.42)**
way Gazette, No. 2, January 14, p. 66.
omiser cylinder lubrication for locomotives. (1 400
ds & fig.)

---

38 **621 .132.6 (.54)**
way Gazette, No. 2, January 14, p. 68.
ew narrow gauge tank engines for India. (200 words
g.)

---

38 **656 .27 (.73)**
way Gazette, No. 2, January 14, p. 72.
nversion to a highway of the Florida Keys Railway.
words & fig.)

---

38 **656 .1 (.42)**
way Gazette, No. 2, January 14, p. 73.
ew 75-ton low-loading trailer. (700 words & fig.)

---

38 **385 .517 (.42)**
way Gazette, No. 2, January 14, p. 74.
ndon Transport staff canteens. (1 500 words & fig.)

---

38 **614 .8 (.42)**
way Gazette, No. 2, January 14, p. 81.
e L. M. S. R. air raid precautions unit. (350 words
g.)

---

37 **621 .43 (.44)**
el Railway Traction, p. 1226, Supplt. to the Railway
Gazette, December 24.
percharged railcars for the south of France. (1 800
s & fig.)

1937 **621 .43 (.42)**
Diesel Railway Traction, p. 1230, Supplt. to the Railway Gazette, December 24.
Diesel locomotives for the Southern. (900 words & fig.)

1937 **351 .712 (.73) & 621 .43 (.73)**
Diesel Railway Traction, p. 1231, Supplt. to the Railway Gazette, December 24.
Specifications for locomotive oil engines and auxiliaries. (1 500 words.)

1937 **621 .43 (.42)**
Diesel Railway Traction, p. 1232, Supplt. to the Railway Gazette, December 24.
Diesel locomotives for Government service. (600 words & fig.)

1937 **621 .43 & 656 .222.1**
Diesel Railway Traction, p. 1233, Supplt. to the Railway Gazette, December 24.
KOFFMAN (J. L.). — Railcar acceleration. (1 900 words & fig.)

1937 **621 .35**
Diesel Railway Traction, p. 1236, Supplt. to the Railway Gazette, December 24.
An improved form of railcar battery. (500 words & fig.)

1938 **621 .33 (∞)**
Electric Railway Traction, p. 41, Suppl. to the Railway Gazette, January 7.
Railway electrification in 1937. (1 100 words.)

1938 **621 .33 (.438)**
Electric Railway Traction, p. 42, Supplt. to the Railway Gazette, January 7.
Railway electrification in Poland. (5 900 words & fig.)

1938 **621 .338 (.931)**
Electric Railway Traction, p. 51, Supplt. to the Railway Gazette, January 7.
Multiple-unit trains for New Zealand. (1 700 words.)

Railway Magazine. (London.)

1938 **385 (093 (.41)**
Railway Magazine, No. 487, January, p. 1.
BROWN (K.). — The first railway in Scotland. (900 words & fig.)

1938 **656 .27 (.41)**
Railway Magazine, No. 487, January, p. 5.
BRYANT (R. W. G.). — Withdrawn Aberdeen suburban. (1 000 words & fig.)

1938 **656 .27 (.41)**
Railway Magazine, No. 487, January, p. 7.
LANGMUIR (G. E.). — Closed stations in the Glasgow District. (2 600 words & maps.)

1938 **656 .222.1 (41)**
Railway Magazine, No. 487, January, p. 12.
ALLEN (C. J.). — **British locomotive practice and performance.** (4 700 words & fig.)

1938 **625 .4 (.41)**
Railway Magazine, No. 487, January, p. 29.
ELLIS (C. H.). — **The Glasgow Underground lines.** (3 500 words & fig.)

1938 **621 .132.3 (.42)**
Railway Magazine, No. 487, January, p. 36.
ALLEN (C. J.). — **The rebuilt No. 10000, L. N. E. R.** (2 300 words & fig.)

1938 **385. (09 (.41)**
Railway Magazine, No. 487, January, p. 41.
NOCK (O. S.). — **The Callander and Oban section of the L. M. S. R.** (5 600 words & fig.)

Railway Mechanical Engineer. (New York.)

1937 **621 .132.5 (.73)**
Railway Mechanical Engineer, No. 12, December, p. 555.
Kansas City Southern **freight locomotives.** (2 000 words & fig.)

1937 **621 .118 & 621 .138**
Railway Mechanical Engineer, No. 12, December, p. 560.
HALL (J. M.). — **Inspection and safety.** (4 200 words.)

1937 **621 .43**
Railway Mechanical Engineer, No. 12, December, p. 563.
Diesel engine development. (1 000 words.)

1937 **625 .234 (.73)**
Railway Mechanical Engineer, No 12, December, p. 564.
Spray-type **air-conditioning system.** (2 100 words & fig.)

1937 **625 .2 (0**
Railway Mechanical Engineer, No. 12, December, p. 566.
MUSSEY (W. H.). — Developments in **car design.** (6 000 words.)

Railway Signaling. (Chicago.)

1938 **313 : 656 .25 (.73)**
Railway Signaling, January, p. 19.
Signaling construction increased in 1937. (1 900 words & fig.)

1938 **625 .258 (.73)**
Railway Signaling, Januari, p. 25.
Improving yard operations on Lackawanna. (4 200 words & fig.)

1938 **656 .256.3 (.73) & 656 .258 (.73)**
Railway Signaling, January, p. 31.
Automatic blocks and three interlockings installed on the Omaka. (6 000 words & fig.)

1938 **656 .253 (.7**
Railway Signaling, January, p. 39.
E. J. & E. installs A. P. B. signaling. (1 900 words fig.)

1938 **656 .215 (.73) & 656 .259 (.7**
Railway Signaling, January, p. 41.
Floodlights at highway crossing. (900 words & fig.)

South African Railways and Harbours Magazin (Johannesburg.)

1937 **621 .132.5 (.68**
South African Railways & Harbours Magazine, Decem ber, p. 1587.
New (2 + 10 + 4) engine for the South African Ra ways. (2 100 words & fig.)

The Locomotive. (London.)

1938 **621 .132.5 (.68**
The Locomotive, N° 545, January 15, p. 7.
2-10-4 heavy goods engine, South African Railway (1 000 words & fig.)

1938 **621 .132.1 (.41**
The Locomotive, No. 545, January 15, p. 9.
REED (K. H.) and FAYLE (H.). — Recent develo ments of **Irish locomotive practice,** Great Southern Ra ways. (1 300 words & fig.)

1938 **385. (091 (.51**
The Locomotive, No. 545, January 15, p. 11.
The rehabilitation of China's railways. (3 100 wor & fig.)

1938 **621 .132.8 (.42**
The Locomotive, No. 545, January 15, p. 15.
Recent industrial locomotives. (800 words & fig.)

1938 **621 .132.1 (093 (.42**
The Locomotive, No. 545, January 15, p. 18.
L. M. S. R. locomotives, history of the Somerset a Dorset Joint Railway. (2 000 words & fig.)

1938 **621 .131.2 (.54**
The Locomotive, No. 545, January 15, p. 21.
Experimental locomotives for the Indian State Ra ways. (1 500 words.)

1938 **625 .232 (.945**
The Locomotive, No. 545, January 15, p. 23.
Victorian Railways. **Luxury train : « Spirit of Pr** gress. (1 700 words & fig.)

1938 **621 .132.1 (.42**
The Locomotive, No. 545, January 15, p. 26.
MORRIS (O. J.). — **Standardising Southern Railwa locomotives,** central section. (2 500 words & fig.)

The Oil Engine. (London.)

1938 **621 .43 (08**

e Oil Engine, No. 57, Mid January, p. 274.
Diesel rail traction in 1937. (1 300 words & fig.)

1938 **621 .43 (.4)**

e Oil Engine, No. 57, Mid January, p. 284.
The largest European Diesel locomotive. (900 words & .)

1938 **621 .43**

e Oil Engine, No. 57, Mid January, p. 292.
The progress of two-cycle engines. (1 500 words & .)

1938 **621 .43 (.492)**

e Oil Engine, No. 57, Mid January, p. 298.
The latest Diesel rolling stock in Holland. (800 words fig.)

1938 **621 .43**

e Oil Engine, No. 57, Mid January, p. 300.
The development of pressure-charging. (1 900 words.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1937 **691. (.45)**

nali dei lavori pubblici, ottobre, p. 811.
SIMONE (D. de). — La normalizzazione dei metodi prova e d'accettazione dei cementi in Italia. (10 600 role & 3 quadri.)

1937 **624 .2**

nali dei lavori pubblici, ottobre, p. 835.
TAGLIALATELA (C.). — Le linee d'influenza nella ve continua. (1 200 parole.)

La tecnica professionale. (Firenze.)

1938 **621 .433.3**

tecnica professionale, gennaio, p. 5.
MICHELUCCI (A.). — Corrosioni nei tubi bollitori di one delle caldaie di locomotive. (2 200 parole.)

L'Ingegnere. (Roma.)

1937 **721 .4**

ngegnere, dicembre, p. 537.
COLONNETTI (G.). — Nuovi punti di vista sulla tica degli archi molto ribassati. (4 600 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1937 **621 .43 (.45)**

Rivista tecnica delle ferrovie italiane, 15 dicembre, p. 377.
CUTTICA (A.). — Le automotrici delle Ferrovie dello Stato. Considerazioni generali. (4 300 parole.)

1937 **621 .333**

Rivista tecnica delle ferrovie italiane, 15 dicembre, p. 386.
FRANCO DI MAIO. — Fenomeni transitori nei motori di trazione a corrente continua. (2 700 parole & fig.)

1937 **621 .133.7**

Rivista tecnica delle ferrovie italiane, 15 dicembre, p. 398.
NALINI (G.) & MICHELUCCI (A.). — Depuratore chimico d'acqua a scambio di basi. (3 000 parole & fig.)

Trasporti e lavori pubblici. (Roma.)

1937 **621 .43 (.45)**

Trasporti e lavori pubblici, novembre, p. 369.
Ultrarapidi Fiat per le Ferrovie delle Stato. (1 600 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1937 **624 .63 (.492)**

De Ingenieur, Nr. 53, 31 December, p. B. 179.
HARMSEN (J. H.). — De overbrugging voor gewoon verkeer van de Maas bij Hedel. (5 400 woorden & fig.)

Spoor- en Tramwegen. (Utrecht.)

1938 **625 .163 (.492)**

Spoor- en Tramwegen, Nr. 2, 18 Januari, p. 27.
LEOPOLD (G.). — De stationsversiering der Nederlandsche Spoorwegen in 1937. (1 600 woorden & fig.)

1938 **621 .132.1 (.497.2)**

Spoor- en Tramwegen, Nr. 2, 18 Januari, p. 29.
De locomotiven der Boelgaarsche Staatsspoorwegen. (700 woorden & fig.)

1938 **625 .62**

Spoor- en Tramwegen, Nr. 2, 18 Januari, p. 36.
ZONNEVELD (W. M.). — Wegverharding in en langs stoomtramwegen in steden. (1 200 woorden & fig.)

In Polish.

(= 91.885)

Inżynier Kolejowy. (Warszawa.)

1937 **625 .14 = 91 .885**

Inzynier Kolejowy, No. 12. p. 474.

BESSAGA (M.). — **Dislocation of short rails laid on curves** and transitions. (2 500 words & fig.)

1937 **625 .142.2 = 91 .885**

Inzynier Kolejowy, No. 12, p. 481.

KRÜGER (A. W.). — Considerations on the use of **beach sleepers.** (3 000 words & fig.)

1937 **621 .33 (.438) = 91 .885**

Inzynier Kolejowy, No. 12, p. 484.

EIMONT (M.). — The status of the **electrification of the Polish State Railways.** (1 500 words, tables & fig.)

1938 **385 (.4) = 91 .885**

Inzynier Kolejowy, No. 1, p. 5.

GIEYSZTOR (J.). — Reorganisation of **European Railway Administrations.** (3 000 words.)

1938 **621 .133.1 = 91 .885**

Inzynier Kolejowy, No. 1, p. 8.

OGUREK (O.). — **Traction methods and fuel problems specially** from the point of view of the requirements of the Polish State Railways. (7 000 words.)

1938 **614 = 91 .8**

Inzynier Kolejowy, No. 1, p. 21.

HOZER (J.). — **Organisation of safety and hygi of the work in industry and on railways.** (6 500 wor

---

1938 **621 .33 (.438) = 91 .8**

Inzynier Kolejowy, No. 1, p. 35.

PLEWAKO (S.). — Completion of the first stage **the electrification of the Warsaw railway juncti** (3 500 words & fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1938 **621**

Gazeta dos caminhos de ferro, nº 1201, 1 de janeiro, p.

GUEDES (A.). — **Automotoras.** Aspectos económi da exploração. (1 000 palavras.)

Técnica. (Lisboa.)

1938 **624 .51 (.46**

Técnica, janeiro, p. 379.

MENDONÇA (Zuzarte de). — **A construção da po** sôbre o Tejo em frente de Lisboa. (1 800 palavras & fi

---

1938 **624**

Técnica, janeiro, p. 382.

MAGNEL (G.). — **Viga de comprimento finito asse** sôbre terreno elástico. (3 100 palavras & fig.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(APRIL 1938)

6. 385. (02]

I. — BOOKS.

In French.

669. (02

UD (R.).

ıda Dunod : Métallurgie.

s, Dunod, 92, rue Bonaparte. 1 volume, 328 pages figures. (Prix : 25 fr. français.)

691. (02

STIER (V.).

ıda Dunod : Béton armé.

s, Dunod, 92, rue Bonaparte. 1 volume, 324 pages figures. (Prix : 25 fr. français.)

537. (02

CAULT (L.).

ıda Dunod : Electricité.

s, Dunod, 92, rue Bonaparte. 1 volume, 383 pages figures. (Prix : 25 fr. français.)

621. (02

(J.).

ıda Dunod : Construction mécanique.

, Dunod, 92, rue Bonaparte. 1 volume, 336 pages figures. (Prix : 25 fr. français.)

665 .882

ratique de la soudure autogène.

Société suisse de l'Acétylène, 12, Ochsengasse. ne, 236 pages et 223 figures. (Prix : 3.50 fr. fran-

385. (02

(P.).

da Dunod : Chemins de fer.

, Dunod, 92, rue Bonaparte. 1 volume, 400 pages igures. (Prix : 25 fr. français.)

In German.

1938 385. (02

VEREIN MITTELEUROPAISCHER EISENBAHNVERWALTUNGEN.

Alphabetisches Ortsverzeichnis (früher Dr Kochs Ortsverzeichnis). 20te Auflage herausgegeben von A. NETHER, General-sekretär des Vereins. 1 Band (17.5 × 26 cm), 730 Seiten.

Berlin, Wilmersdorf, Verlag Barthol & Co., Prinsregenten Strasse, 53. (Preis : 26 R M.)

In English.

1938 385. (02

A yearbook of railroad information. 1937 edition.

New York : Committee on public relations of the Eastern Railroads, 143, Liberty street. 6 in. × 4 in., 96 pages. Gratis.

1938 621 .94 (02

COLVIN (F. H.) and STANLEY (F. A.).

Grinding practice.

New York : McGraw-Hill Book & Co. Cloth, 6 × 9 in., 310 pages, illustr., diagrams, charts, tables. (Price : $ 3.)

1938 532 & 539

GREEN (S. L.).

Hydro- and aerodynamic's.

New York : Pitman Publishing Corp., 163 pages, (Price : $ 3.50.)

1938 621 .93

HARRIS (P.).

Circular saws.

London : His Majesty's Stationery Office, Adastral House, Kingsway, W. C. 2. (Price : 6 d. net.)

1938 697

HOLMES (R. E.).

Air conditioning in summer and winter.

New York : McGraw-Hill Book Co., 296 pages. (Price : $ 3.)

[1] The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress itly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to ay Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 9).

1938 529. (06

Journal of Calendar Reform, volume 7.

New York. The World, Calendar Association, International Building, 630, Fifth Avenue. No price stated.

1938 621 .43

JUDGE (A. W.).

High speed diesel engines.

London : Chapman and Hall, Ltd., 11, Henrietta street, W. C. 2. (Price : 18 s. net.)

1938 621 .89

KLEMGARD (E. N.).

Lubricating greases : their manufacture and use. A book of practical and scientific data on the manufacture and use of lubricating greases.

London : Chapman and Hall, Limited. (Price : £ 3, 15 s. net.)

1938 625 .1 (09 (.73)

KYNER (J. H.).

End of track.

Caldwell, Idaho : the Caxton Printers, Ltd., 277 pages, 9 in. by 6 in. Bound in cloth. (Price : $ 3.00.)

1938 621 .133.7

Locomotive feed water treatment.

London : Alfloc, Ltd., Bush House, Aldwyck, W. C. 2. (Price : 3 s. 6 d. net.)

1938 385 .15

MIDDLETON (P. H.).

Railways of thirty nations : Government versus private ownership.

New York : Prentice-Hall, Inc., 328 pages. Price not stated.

1938 69

MOLITOR (A.).

Structural engineering problems.

Washington, D. C. : David A. Molitor, 1445, Spring Road. N. W. (Price : $ 2.75.)

1938 3. (06 (.73)

Our State legislators.

A human, realistic, and practical approach to the workings of the modern state legislature. (A series of 26 articles.)

Philadelphia : The American Academy of Political and Social Science. No price stated.

1938 62. (01, 625, 212 & 625 .251

Resistance to heat checking of chilled iron car wheels, and strains developed under long-continued applications of brake shoes.

Urbana : Engineering Experiment Station, University of Illinois. A report of 52 pages. Illustrated. (Price : Fifty-five cents.)

SCHMIDT (E. P.).

1938 388

Industrial relations in urban transportation.

Published in Great Britain for the University of Minnesota Press by Humphrey Milford, Oxford University Press, Amen House, Warwick Square, London, E. C. 4. 264 pages. (Price : 14 s. net.)

1938 38. (09

SEKON (G. A.).

Locomotion in Victorian London.

London : Oxford University Press, Amen House, wick Square, E. C. 4. 9 1/4 in. × 5 3/4 in. × 1 1, 211 pages. Illustrated. (Price : 12 s. 6 d. net.)

1938 625 .143.3 & 625 .

SIMS (A. M.).

Wear of rails on curves and check-rail clearance quired on curves of 40° and sharper. (Technical I No. 303.)

Calcutta : Railway Board of India. A pamphl 55 pages. (Price : Rs. 1-6-0 or 2 s. 6 d.)

1938 385.

STEVENS (W. J.).

The future of British Railways.

London : P. S. King & Son, 14, Great Smith s S. W. 1. 7 1/2 × 5 in × 5/8 in., 101 pages. (P 5 s. net.)

1938 62

Symposium on corrosion testing procedures.

Philadelphia Pa., American Society for Testing terials, 260, South Broad-street. (Price : $ 1.50.)

1938

The Institution of structural engineers. The u high alumina cement in structural engineering. A r for the guidance of structural engineers when high alumina cement.

London : Offices of the Institution. (Price : 6 d.

1937 669. (06

The Journal of the Institute of Metals. Vo LXI. 1937. No. 2. Edited by G. Shaw Scott.

London : Offices of the Institute.

1938 669 .1 (06

The Journal of the Iron and Steel Institute. Vo CXXXVI. Edited by K. Headlam-Morley.

London : Offices of the Institute.

1938 62. (01 &

TIMOSHENKO (S.).

Vibration problems in engineering. (Second ed

London : Constable and Co., Ltd., 10, Orange-s W. C. 2. (Price : 24 s. net.)

1938 621 .1

Traveling Engineers examination book.

Prepared and published by the Railway Fue Traveling Engineer's Association. Old Colony bui Chicago, 256 pages. Bound in cloth. Price of indi copies : $ 1.50, with suitable percentage reductio quantity orders.

In Spanish.

1937 313 .385

INSTITUTO DE ESTUDIOS ECONOMICOS TRANSPORTE, DE BUENOS AIRES.

Estadística de los Ferrocarriles Argentinos, Año

Buenos Aires, Secretaría del dicho Instituto. U leto de 27 páginas.

6. 385. (05]

II. — PERIODICALS.

In French.

Arts et Métiers. (Paris.)

656 .225 & 656 .261

Métiers, décembre, p. 273.

DIEN (G.-L.). — L'utilisation internationale du ainer ». (1 300 mots & fig.)

---

ulletin de la Société d'encouragement pour l'industrie nationale. (Paris.)

621 .9

e la Soc. d'encouragement pour l'ind. nationale, vembre-décembre, p. 487.

'RAL (A.). — L'industrie de la **machine-outil**, son on récente, sa situation dans l'économie nationale. mots & fig.)

---

lletin de la Société des ingénieurs civils de France. (Paris.)

691 & 721 .9

le la Soc. des ing. civ. de France, juillet-août, 530.

SIER (H.). — L'évolution des **constructions en et béton armé** en fonction de l'avenir des ciments. mots & fig.)

691

le la Soc. des ing. civ. de France, juillet-août, 562.

UOT (A.). — Le rôle des matériaux inertes dans **on.** (6 800 mots & fig.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

385 .63

es transp. intern. par ch. de fer, janvier, p. 7.

SSUË (M.-H. de la). — Contribution à l'interprétation de l'article 42, § 3 de la **C. I. M.** — Une pression sinon nécessaire. (6 400 mots.)

---

313 .385 (.44)

es transp. intern. par ch. de fer, janvier, p. 45.

Chemins de fer français pendant l'exercice 1935. mots.)

Electricité. (Paris.)

621 .3 & 625 .26

cité, janvier, p. 7.

OU (M.). — **L'équipement électrique d'ateliers** es de construction de voitures de chemins de fer. mots & fig.)

1938 621 .33 (.3)

Electricité, janvier, p. 18.

Le développement de la **traction électrique** dans le monde en 1936. (1 400 mots.)

Génie civil. (Paris.)

1938 621 .392 & 721 .9

Génie civil, n° 2893, 22 janvier, p. 80; n° 2894, 29 janvier, p. 101.

DEVAULT (J.). — La **soudure électrique** des armatures principales, dans les constructions en béton armé. (9 000 mots & fig.)

1938 621 .335 (.06 (.44)

Génie civil, n° 2893, 22 janvier, p. 85.

MARTIN (H.). — Le **matériel roulant électrique** à l'Exposition internationale de Paris (1937). (1 500 mots & fig.)

1938 624 .62 (.489)

Génie civil, n° 2895, 5 février, p. 121.

CAUFOURNIER (P.). — Le **pont sur le Storström** (Danemark). (3 000 mots & fig.)

La Technique moderne. (Paris.)

1938 624 .63 (.44)

La Technique moderne, n° 3, 1er février, p. 74.

Le nouveau **pont de Joinville**, sur la Marne. (2 500 mots & fig.)

1938 621 .114 (06 (.42)

La Technique moderne, n° 3, 1er février, p. 77.

Le **graissage** et les lubrifiants. (6 500 mots.)

La Traction électrique. (Paris.)

1937 621 .33 (.493)

La Traction électrique, mars-avril, p. 27.

DUQUESNE (E.). — L'**électrification** de la ligne Bruxelles-Anvers de la Société Nationale des Chemins de fer belges, avec le courant continu à 3 000 volts. (Suite et fin.) (7 500 mots & fig.)

1937 621 .33 (.44)

La Traction électrique, novembre, p. 168.

BERTRAND (L.) & NEVEUX (S.). — La **traction électrique** sur la ligne de Culoz à Modane. (2 900 mots & fig.)

1937 621 .335 (.437)

La Traction électrique, novembre, p. 175.

POSIK (V.-V.). — **Locomotive électrique de manœuvre à accumulateurs** des Chemins de fer de l'Etat tchécoslovaque. (4 600 mots & fig.)

L'Economie internationale. (Paris.)

1938 **656**

L'Economie internationale, février, p. 19.

Coordination air-fer. (2 900 mots.)

L'Ossature métallique. (Bruxelles.)

1938 **624 .32 (.54)**

L'Ossature métallique, février, p. 59.

RAVENHILL (D.-W.) & WILSON (G..). — La **reconstruction du pont « Inchcape »** sur la ligne du Bengal and North Western Railway. (Indes anglaises.) (2 900 mots & fig.)

1938 **32. (01 & 624 (0**

L'Ossature métallique, février, p. 72.

GUYOT (F.). — **Contrôle radiographique** par les rayons X d'un **pont soudé** d'autostrade en Allemagne. (4 500 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1938 **385 .57 (.44)**

Revue générale des chemins de fer, février, p. 71.

LEVY (P.) & OUDOT. — La **sélection psychotechnique et psychophysiologique** dans les Chemins de fer français. (8 000 mots & fig.)

1938 **385 .113 (.44)**

Revue générale des chemins de fer, février, p. 86.

KIPFER. — Quelques considérations sur les **Chemins de fer français** et sur leurs résultats d'exploitation. (5 000 mots.)

1938 **625 .23 (.44)**

Revue générale des chemins de fer, février, p. 100.

BERTRAND. — La «**Métallisation** » des voitures à bogies à caisse en bois. (1 800 mots & fig.)

1938 **621 .33 (.4)**

Revue générale des chemins de fer, février, p. 110.

GARREAU. — L'état actuel de l'**électrification** des chemins de fer. (7 000 mots & fig.)

1938 **656 .254 (.45)**

Revue générale des chemins de fer, février, p. 129.

VINOT. — **L'utilisation de la T. S. F.** dans l'exploitation des chemins de fer italiens. (800 mots & fig.)

In German.

Die Reichsbahn. (Berlin.)

1938 **385. (06.4 (.43)**

Die Reichsbahn, Heft 3, 19. Januar, S. 78.

GERSTNER. — Die **Eisenbahnsonderschau** auf der Internationalen Ausstellung Paris 1937. (5 000 Wörter.)

1938 **656.**

Die Reichsbahn, Heft 6, 9. Februar, S. 138.

LAMP. — Welche Auswirkungen hat die **Neureg des Strassenverkehrs** vom 13. November 1937 fü Eisenbahnen ? (3 200 Wörter.)

Elektrische Bahnen. (Berlin.)

1938 **621 .33**

Elektrische Bahnen, Heft 1, Januar, S. 1.

WECHMANN (W.). — Die **elektrische Zugförd** der Deutschen Reichsbahn im Jahre 1937. (4 000 ter.)

1938 **621**

Elektrische Bahnen, Heft 1, Januar, S. 6.

MONATH (L.). — Die **Entwicklung des elektri Vollbahnmotors.** (8 200 Wörter, 8 Tabellen & Ab

---

1938 **62**

Elektrische Bahnen, Heft 1, Januar, S. 19.

BUCHHOLD (Th.). — Über die **Nutzbremsun** Wechselstromfahrzeugen. (1 900 Wörter & Abb.)

1938 **621**

Elektrische Bahnen, Heft 1, Januar, S. 22.

KASTNER (N.). — Sichereitseinrichtung fü Führerstände **einmännig bedienter elektrischer fahrzeuge.** (1 400 Wörter, 1 Abb.)

Organ für die Fortschritte des Eisenbahnwe (Berlin.)

1938 **625 .1**

Organ für die Fortschr. des Eisenbahnw., Heft 3, bruar, S. 45.

HANKER (R.). — Die Entwicklung der **Oberb rechnung.** (11 000 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingeni (Berlin.)

1938 **621 .33**

Zeitschr. des Ver. deutsch. Ing., Nr. 4, 22. Januar,

SCHMER (K.). — Die **Umrichteranlage** der W talbahn. (4 300 Wörter & Abb.)

1938 **621**

Zeitschr. des Ver. deutsch. Ing., Nr. 4, 22. Januar,

TÖFFLINGER (K.). — **Lokomotivmotoren** fü phasenwechselstrom von 50 Hz. (700 Wörter & Ab

---

1938 **625**

Zeitschr. des Ver. deutsch. Ing., Nr. 4, 22. Januar,

MÖLLER (E.). — Selbsttätiges **Führerbremsven Lokomotiven.** (700 Wörter & Abb.)

1938 **621 .392 &**

Zeitschr. des Ver. deutsch. Ing., Nr. 7, 12. Februar,

GRAF (O.). — Über **Dauerversuche** mit Gurtve kungen an Zugstäben und an Trägern. (1 500 Wö Abb.)

eitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

385. (.4)
des Ver. mitteleurop. Eisenbahnverw., Nr. 4, Januar, S. 82; Nr. 5, 3. Februar, S. 104.
blick auf das Jahr 1937. (28 300 Wörter.)

---

621 .139 (.43), 625 .18 (.43) & 625 .27 (.43)
des Ver. mitteleurop. Eisenbahnverw., Nr. 5, Februar, S. 99.
ELIUS. — Das **Beschaffungswesen** der Deutschen Reichsbahn. (3 700 Wörter.)

---

621 .139 (.43), 625 .18 (.43) & 625 .27 (.43)
des Ver. mitteleurop. Eisenbahnverw., Nr. 6, Februar, S. 127.
ELIUS. — Das **Beschaffungswesen** der Deutschen Reichsbahn. (4 800 Wörter.)

---

656 .2 (.43)
des Ver. mitteleurop. Eisenbahnverw., Nr. 7, Februar, S. 143.
BE. — Die Grundzüge des Entwurfs zur neuen **Eisenbahn-Verkehrsordnung.** (6 500 Wörter.)

In English.

ılletin, American Railway Engineering Association. (Chicago, Ill.)

625 .12 (.73)
, Amer. Railway Engin. Assoc., No. 401, January, 315.
t of Committee I — Roadway — Culverts, tun-. (9 000 words.)

---

625 .141 (.73)
, Amer. Railway Engin. Assoc., No. 401, January, 337.
t of Committee II — Ballast. (300 words.)

---

625 .142 (.73)
, Amer. Railway Engin. Assoc., No. 401, January, 339.
t of Committee III — Ties. Substitute ties. seasoning of oak ties, etc. (6 900 words.)

---

625 .143 (.73)
, Amer. Railway Engin. Assoc., No. 401, January, 355.
t of Committee IV — Rail. Rail failure statis- 1936. Rail lengths in excess of 39 feet. Conti- velding of rail, etc. (12 500 words, tables & fig.)

---

625 .14 (.73)
, Amer. Railway Engin. Assoc., No. 401, January, 01.
t of Committee V — Track. Plans and speci- for track tools. Welding of manganese cast- special track work. Lubrication of rail on etc. (9 100 words & fig.)

1938 625 .162 (.73 & 656 .259 (.73)
Bulletin, Amer. Railway Engin. Assoc., No. 401, January, p. 429.
Report of Committee IX — Highways. (1 700 words & fig.)

Electrical Industries. (London.)

1938 621 .31
Electrical Industries, February, p. 71.
LAMBERT (D. E.). — **Automatic synchronisers.** (3 500 words & fig.)

Engineer. (London.)

1938 621 .43
Engineer, No. 4280, January 21, p. 72 and No. 4281, January 28, p. 99.
Oil engined rail traction in 1937. (5 300 words & fig.)

1938 621 .5 (.42 & 625 .13 (.42)
Engineer, No. 4280, January 21, p. 85.
Compressor plant for Dartford-Purfleet tunnel works. (2 300 words & fig.)

1938 625 .154 (.492)
Engineer, No. 4280, January 21, p. 88.
A 30-metre locomotive turntable. (1 600 words & fig.)

1938 621 .331
Engineer, No. 4281, January 28, p. 107.
A trolleybus rectifier sub-station. (900 words & fig.)

1938 621 .43 (.944
Engineer, No. 4281, January 28, p. 108.
Oil-engined trains for New South Wales. (1 100 words & fig.)

1938 62. (01 & 621
Engineer, No. 4281, January 28, p. 111.
Specifications for machine tools. (1 300 words.)

1938 621 .335 (.54), 621 .43 (.54) & 625 .232 (.54)
Engineer, No. 4281, January 28, p. 115.
Oil-electric trains for Ceylon. (3 300 words & fig.)

1938 62. (01 & 621.9
Engineer, No. 4281, January 28, p. 118.
SCHLESINGER (G.). — **Machine tool tests and alignments.** (5 000 words & fig.)

1938 621 .165
Engineer, No. 4282, February 4, p. 128 and No. 4283, February 11, p. 156.
YATES (H. G.). — **Steam turbine performance at partial loads.** (7 900 words & fig.)

1938 624. (07 (.44) & 627 .82 (07 (.44)
Engineer, No. 4282, February 4, p. 135.
A dam and bridge laboratory. (2 000 words & fig.)

1938 **385.** (093 (.47)
Engineer, No. 4282, February 4, p. 140.
WILSON (F. R.). — **One hundred years of Russia's Railways.** (3 600 words.)

1938 **621** .16 (.42) & **625** .3 (.42)
Engineer, No. 4282, February 4, p. 142.
Two historic winding engines. (900 words & fig.)

1938 **656** .25 (.931)
Engineer, No. 4282, February 4, p. 144.
Signaling developments on New Zealand Government Railways. (1 200 words.)

1938 **621** .43
Engineer, No 4282, February 4, p. 146.
LUGT (G. J.). — **Diesel varia.** (7 000 words & fig.)

1938 **621** .131.3
Engineer, No. 4283, February 11, p. 159.
FRY (L. H.). — **The analysis of locomotive test data.** (2 900 words & fig.)

1938 **621** .392 (.42) & **625** .143.4 (.42)
Engineer, No. 4283, February 11, p. 164.
Rail welding plant for London Transport. (1 100 words & fig.)

1938 **62.** (01 & 669.1
Engineer, No. 4283, February 11, p. 175.
SWINDEN (T.). — **Inspection as applied to iron and steel.** (3 000 words.)

Engineering. (London.)

1938 **621** .4
Engineering, No. 3758, January 21, p. 55.
LANCHESTER (F. W.). — **The energy balance sheet of the gas engine.** (1 300 words & fig.)

1938 **62.** (01
Engineering, No. 3758, January 21, p. 61.
The analysis of elastic structures. (1 500 words.)

1938 **656** .221
Engineering, No. 3758, January 21, p. 62.
The resistance of trains. (400 words.)

1938 **388**
Engineering, No. 3758, January 21, p. 68.
Travelling facilities in the London area. (2 700 words.)

1938 **656** .212.6 (.44)
Engineering, No. 3758, January 21, p. 75.
250 ton floating crane for Brest naval dockyard. (3 500 words & fig.)

1938 **621** .338 (.45)
Engineering, No. 3759, January 28, p. 89.
The Breda electric streamline train. (2 800 words & fig.)

1938 **621.** (06
Engineering, No. 3759, January 28, p. 99.
The Institution of Mechanical Engineers. words.)

1938 **62.** (01 &
Engineering, No. 3759, January 28, p. 104.
SCHLESINGER (G.). — **Machine tool tests alignments.** (2 200 words.)

1938 **6**
Engineering, No. 3759, January 28, p. 108.
The refining of metals by the sodium carbonat cess. (700 words.)

1938 **62**
Engineering, No. 3760, February 4, p. 114.
LANCHESTER (F. W.). — **The energy balance** (1 900 words & fig.)

1938 **621** .43 (
Engineering, No. 3760, February 4, p. 120.
YOUNG (H.). — **Diesel-engined train** for the South Wales Government Railways. (1 200 words &

1938 **656** .213
Engineering, No. 3761, February 11, p. 139.
The handling of motor-car traffic at Dover. words & fig.)

1938 **621** .392 (.42) & **625** .143.4
Engineering, No. 3761, February 11, p. 145.
Rail-welding plant; London Passenger Tra Board. (1 700 words & fig.)

1938 **62.** (01 &
Engineering, No. 3761, February 11, p. 162.
SCHLESINGER (G.). — **Machine-tool tests and ments.** (1 500 words & fig.)

1938 **62**
Engineering, No. 3761, February 11, p. 164.
FIEGEHEN (E. G.). — **The hoisting motion o tric overhead cranes.** (1 400 words.)

Engineering News-Record. (New York.)

1938 **621** .1
Engineering News-Record, No. 3, January 20, p.
Deep piers for Baton Rouge bridge. (2 300 wo fig.)

1938 **624.**
Engineering News-Record, No. 3, January 20, p.
Overpass on rigid frame bents. (1 100 words &

1938
Engineering News-Record, No. 3, January 20, p.
KRUYS (F.). — Influence lines by moment bution. (1 200 words & fig.)

1938 **624.**
Engineering News-Record, No. 4, January 27, p.
BARTELS (W. R.). — **Hawaii builds long rigid** (700 words & fig.)

urnal, Institute of Transport. (London.)

8 **656.** (.42)
al, Institute of Transport, No. 4, February, p. 138.
TH (F.). — The progress of transport co-ordin-
in Great Britain. (6 200 words.)

8 **385** .21 (.42)
al, Institute of Transport, No. 4, February, p. 145.
DBURY (G.). — **The economic future of canals.**
0 words.)

Journal, Institution of Civil Engineers. (London.)

8 **65**
al, Institution of Civil Engineers, No. 4, February,
3.
(Sir G.). — **Recent engineering developments in**
eneral Post Office. (19 000 words & fig.)

8 **62.** (01 & 693
al, Institution of Civil Engineers, No. 4, February,
43.
SS (A. D.). — **The creep of Portland blast-furnace**
t concrete. (3 800 words.)

8 **613 & 656** .1
al, Institution of Civil Engineers, No. 4, February,
97.
ineering research. Final report of the Depart-
l Committee on noise in the operation of me-
ally propelled vehicles. (500 words.)

rnal, Institution of Engineers, Australia. (Sydney.)

7 **624** .51 (.944)
al, Institution of Engineers, Australia, No. 12,
ecember, p. 463.
RMALSKY (V.) and BRITTON (A. T.). — Three
light suspension bridge over Hastings River at
e Crossing, N. S. W. (5 300 words & fig.)

Mechanical Engineering. (New York.)

8 **621** .392
nical Engineering, No. 2, February, p. 135.
PER (J. M.). — **Resistance-welding fabrication.**
ot, seam, projection, and butt-flash methods,
words & fig.)

Modern Transport. (London.)

8 **656.** (.42)
n Transport, No. 984, January 22, p. 3.
nsport and the Nation. Expenditure of £614 000 000
r. Increasing demand for a vital public service.
words.)

8 **656.** (.438)
n Transport, No. 984, January 22, p. 4.
nsport developments in Poland. (800 words.)

1938 **625** .4 (.42)
Modern Transport, No. 984, January 22, p. 4.
Metropolitan line improvements. (1 000 words.)

1938 **623.** (.43)
Modern Transport, No. 984, January 22, p. 7.
Air raid precautions in Germany. (1 900 words.)

1938 **385** .15
Modern Transport, No. 985, January 29, p. 3; No. 986, February 5, p. 3 and No. 987, February 12, p. 3.
Nationalisation of Transport. (7 200 words.)

1938 **621** .131.3 (.42)
Modern Transport, No. 985, February 29, p. 4.
Locomotive testing station. (200 words.)

1938 **621** .43 (.54)
Modern Transport, No. 985, January 29, p. 7.
Diesel-electric traction in Ceylon. (2 700 words & fig.)

1938 **621** .132.4 (.42)
Modern Transport, N° 986, February 5, p. 4.
New goods engines for Southern Railway. (500 words & fig.)

1938 **621** .43 (.944)
Modern Transport, No. 986, February 5, p. 5.
High-speed diesel trains for Australia. (1 200 words & fig.)

1938 **621** .16 (.42) **& 625** .3 (.42)
Modern Transport, No. 986, February 5, p. 9.
Incline working on L. M. S. R. Stationary winding engines in Derbyshire and Leicestershire. (1 200 words & fig.)

1938 **625** .235 (.42)
Modern Transport, No. 987, February 12, p. 4.
Vacuum-operated door equipment. (800 words & fig.)

1938 **625** .4 (.42)
Modern Transport, No. 987, February 5, p. 5.
Reinforced concrete railway underbridge. (1 700 words & fig.)

1938 **621** .392 (.42) **& 625** .143.4 (.42)
Modern Transport, No. 987, February 12, p. 8.
Rail-welding equipment for London tubes. (1 600 words & fig.)

1938 **625** .245 (.494)
Modern Transport, No. 987, February 12, p. 9.
Rail conveyance of motor cars. (500 words & fig.)

1938 **625** .215 (.439)
Modern Transport, No. 987, February 12, p. 9.
Special bogie for oil-engined railcars. (400 words & fig.)

1938 **621** .138.3
Modern Transport, No. 987, February 12, p. 10.
Cleaning of engines. (700 words.)

Proceedings, American Society of Civil Engineers. (New York.)

1938 **624 .5**
Proc., Americ. Soc. Civil Eng., No. 1, January, p. 69.
Preliminary **design of suspension bridges.** (9 000 words & fig.)

1938 **62. (01 & 624 .2**
Proc., Americ. Soc. Civil Eng., No. 1, January, p. 99.
Structural behavior of battle-deck floor systems. (9 200 words & fig.)

1938 **624 .2**
Proc., Americ. Soc. Civil Eng., No. 1, January, p. 123.
Relative flexure factors for analyzing continuous structures. (3 900 words & fig.)

Proceedings, Institution of Mechanical Engineers. (London.)

1937 **621 .134.5, 621 .43 & 625 .214**
Proceedings, Instit. of Mechanical Engineers, Vol 136, June-November, p. 121.
General discussion on lubrication and lubricants. Journal and thrust bearings. Engine lubrication. Industrial applications. Properties and testing. (20 000 words.)

1937 **621 .4 (09**
Proceedings, Instit. of Mechanical Engineers, Vol 136, June-November, p. 195.
LANCHESTER (F. W.). — **The gas engine and after.** (23 500 words & fig.)

1937 **621 .6**
Proceedings, Instit. of Mechanical Engineers, Vol 136, June-November, p. 245.
ANGUS (R. W.). — **Water hammer in pipes,** including those supplied by centrifugal pumps : graphical treatment. (34 000 words & fig.)

1937 **621 .131.3 & 656 .222.1**
Proceedings, Instit. of Mechanical Engineers, Vol 136, June-November, p. 333.
FAIRLESS (T.). — **The application of the locomotive to traffic working.** (7 000 words & fig.)

1937 **385. (092**
Proceedings, Instit. of Mechanical Engineers, Vol 136, June-November, p. 373.
PARSONAGE (W. R.). — **A short biography of George Stephenson.** (9 000 words & fig.)

Proceedings, Institution of Railway Signal Engineers. (Reading.)

1937 **656 .25 (0**
Proceedings, Institution of Railway Signal Engineers, February-September, p. 20.
PROUD (H. M.). — Some notes on **power signalling** in Great Britain during the Twentieth Century. (8 500 words.)

1937 **656 .**
Proceedings, Institution of Railway Signal Engine February-September, p. 38.
WAGENRIEDER (B. F.). — **Running signals.** (14 words.)

1937 **385. (071.3 & 656**
Proceedings, Institution of Railway Signal Engine February-September, p. 68.
FRASER (J. H.). — **The training of maintena staff for signal and telegraph work.** (11 000 words.)

1937 **621**
Proceedings, Institution of Railway Signal Engine February-September, p. 92.
BAYLES (E. A.). — **Rubber insulated cables and effect of outside conditions and agencies on the die tric.** (8 000 words.)

Railway Age. (New York.)

1938 **621 .335 (.73) & 621 .43 (.**
Railway Age, No. 3, January 15, p. 147.
Third « Rebel » enters the service of the G. M. & (1 900 words & fig.)

1938 **625 .13 (.**
Railway Age, No. 3, January 15, p. 152.
Unique bridge rolling procedure proves highly ef tive. (3 300 words & fig.)

1938 **656 .262 (.**
Railway Age, No. 4, January 22, p. 182.
Union Pacific completes **new hotel** in Sun Val (2 700 words.)

1938 **621 .118 (.**
Railway Age, No. 4, January 22, p. 187.
Locomotive inspection report. (1 400 words & fig

1938 **656 .237.4 (**
Railway Age, No. 4, January 22, p. 194.
GARNER (N.). — **Simplifying interline accou** (3 000 words.)

1938 **656 .261 (**
Railway Age, No. 4, January 22, p. 198.
Inland station five years old. (1 800 words & fig

1938 **656. (**
Railway Age, No. 4, January 22, p. 203.
S. A. R. rail-motor co-ordination. — Railways African Dominion make use of trucks and buses to plement their service. (800 words & fig.)

1938 **625 .142.2 (.73) & 691. (06 (**
Railway Age, No. 5, January 29, p. 221.
Wood preservers meet in Chicago. (4 000 words.)

1938 **621 .43 (**
Railway Age, No. 5, January 29, p. 224.
Two more streamliners for Pacific Coast Ser (5 600 words & fig.)

38 385 .1
ay Age, No. 5, January 29, p. 233.
EMENT (M. W.). — **What the Railways need.** words.)

38 385 .3 (08 (.73) & 614 .8 (.73)
ay Age, No. 5, January 29, p. 236.
eau of safety annual report. (2 200 words.)

38 624. (.73)
ay Age, No. 6, February 5, p. 260.
s expensive plan presents better appearance. (1 400 & fig.)

38 669 .1
ay Age, No. 6, February 5, p. 267.
EEHAN (W. H.). — **Steel castings and the rail-** (5 300 words & fig.)

38 621 .139 (.73), 625 .18 (.73) & 625 .27 (.73)
ay Age, No. 6, February 5, p. 275.
RK (J. C.). — **Handling scrap for profit on Rock** l. (1 700 words & fig.)

Railway Engineering and Maintenance. (Chicago.)

38 625 .14 (.73)
ay Engineering and Maintenance, February, p. 87.
RIES (R.). — **Progress ? Lots of it in track design.** words & fig.)

38 691
ay Engineering and Maintenance, February, p. 89.
YER (C. J.). — **Preframing timber before treat-** (2 000 words & fig.)

38 614 .8 & 625 .17
ay Engineering and Maintenance, February, p. 92.
NGMAN (C. H.). — **Unsafe practices.** — a few al examples. (3 000 words & fig.)

38 621 .392 & 625 .143.4
ay Engineering and Maintenance, February, p. 96.
ONSON (C. B.). — **Arc welding rail ends** — some nent considerations. (2 200 words & fig.)

38 625 .142.2 (.73) & 691. (.73)
ay Engineering and Maintenance, February, p. 98.
RD (R. H.). — **What treated ties mean to the** Island. (1 100 words & fig.)

38 725 .32 (.73)
ay Engineering and Maintenance, February, p. 100.
freight house gets face lifted. (900 words & fig.)

Railway Gazette. (London.)

38 621 .132.3 (.54)
ay Gazette, No. 3, January 21, p. 110.
v locomotives for India. (1 800 words & fig.)

1938 625 .13 (.460)
Railway Gazette, No. 3, January 21, p. 114.
The **new River Jerte bridge.** (400 words & fig.)

1938 625 .214 (.81)
Railway Gazette, No. 3, January 21, p. 115.
Roller bearing wagons for Central Railway of Brazil. (200 words & fig.)

1938 621 .135 (01 (.54) & 625 .172 (.54)
January Gazette, No. 3, January 21, p. 116.
East Indian Railway **experimental derailments.** (800 words & fig.)

1938 621 .392 & 625 .152
Railway Gazette, No. 3, January 21, p. 117.
A welded railway crossing. (200 words & fig.)

1938 625 .212.6 (.43)
Railway Gazette, No. 3, January 21, p. 118.
Heavy mobile railway cranes. (900 words & fig.)

1938 656 .29
Railway Gazette, No. 3, January 21, p. 119.
Minor sources of railway revenue. (700 words.)

1938 621 .133.3 (.42) & 621 .138.5 (.42)
Railway Gazette, No. 3, January 21, p. 120.
Machining superheater flue tubes for locomotive boi- lers. (300 words & fig.)

1938 625 .23 (.44)
Railway Gazette, No. 3, January 21, p. 131.
Lightweight rolling stock in France. (900 words.)

1938 656 .25 (.931)
Railway Gazette, No. 4, January 28, p. 169.
WYLES (G. W.). — **Signalling developments in New** Zealand. 4 600 words & fig.)

1938 621 .135 (01
Railway Gazette, No. 4, January 28, p. 174.
Locomotive stability. (300 words & fig.)

1938 621 .132.5 (.56)
Railway Gazette, No. 4, January 28, p. 175.
New 2-10-0 heavy freight locomotives for the Turkish State Railways. (1 800 words & fig.)

1938 621 .392 (.44) & 621 .134.1 (.44)
Railway Gazette, No. 4, January 28, p. 178.
MONIER (E.). — **Welded cylinders for 2-8-2 loco-** motives, P. O.-Midi Railway. (2 000 words & fig.)

1938 385. (074 (.42)
Railway Gazette, No. 4, January 28, p. 183.
Additions to York Railway Museum. (300 words & fig.)

1938 656 .222.1
Railway Gazette, No. 5, February 4, p. 211.
ALLEN (C. J.). — **Railway speed developments in** 1937. (2 000 words & tables.)

1938 **625 .1 (.494) & 656 .211 (.494)**
Railway Gazette, No. 5, February 4, p. 216.
Zurich main station improvements. (1 300 words & fig.)

1938 **621 .132.4 (.42)**
Railway Gazette, No. 5, February 4, p. 219.
New 0-6-0 type freight engines, Southern Railway. (300 words & fig.)

1938 **698**
Railway Gazette, No. 5, February 4, p. 220.
The Pahl **hot-spray painting progress.** (600 words & fig.)

1938 **656 .222.1 (.42)**
Railway Gazette, No. 6, February 11, p. 257.
The G. W. R. London-Birmingham service. — Physical difficulties of the route. — Point-to-point times of a 1 3/4-hour 300-ton train compared with 2-hour 400-ton train. (2 200 words.)

1938 **656 .1 (.42)**
Railway Gazette, No. 6, February 11, p. 264.
New-London transport private hire fleet. (1 200 words & fig.)

1938 **621 .392 (.42) & 625 .143.4 (.42)**
Railway Gazette, No. 6, February 11, p. 271.
Automatic butt welding of rails, London Passenger Transport Board. (1 100 words & fig.)

1938 **621 .132.3 (.42)**
Railway Gazette, No. 6, February 11, p. 273.
Mixed traffic locomotives for the Great Western Railway. (200 words & fig.)

1938 **621 .4 (.42)**
Diesel Railway Traction, p. 139, Supplt. to the Railway Gazette, January 21.
Oil engine traction in the British Isles. (600 words & fig.)

1938 **621 .43 (.4)**
Diesel Railway Traction, p. 140, Supplt. to the Railway Gazette, January 21.
Large-scale programmes of the Continent. (700 words & fig.)

1938 **621 .43 & 621 .8**
Diesel Railway Traction, p. 142, Supplt. to the Railway Gazette, January 21.
Transmissions. (1 900 words & fig.)

1938 **621 .43 (.93)**
Diesel Railway Traction, p. 145, Supplt. to the Railway Gazette, January 21.
A record of progress in Australasia. (700 words & fig.)

1938 **621 .43**
Diesel Railway Traction, p. 146, Supplt. to the Railway Gazette, January 21.
Engines and superchargers. (1 700 words & fig.)

1938 **621 .43 (.5 +**
Diesel Railway Traction, p. 149, Supplt. to the Railv Gazette, January 21.
Diesel traction in Asia and Africa. (700 words & f

1938 **621 .43 (**
Diesel Railway Traction, p. 150, Supplt. to the Railv Gazette, January 21.
The year (1937) in South America. (1 000 words fig.)

1938 **621**
Diesel Railway Traction, p. 152, Supplt. to the Railv Gazette, January 21.
Engine and mechanical equipment. (900 words & f

1938 **621 .43 (.4**
Diesel Railway Traction, p. 154, Supplt. to the Railv Gazette, January 21.
Railcar practice in Rumania. (300 words & fig.)

1938 **621 .43 (**
Diesel Railway Traction, p. 155, Supplt. to the Railv Gazette, January 21.
SIMONS (R. L.). — **A record year in America.** (1 words & fig.)

1938 **621 .335 (.9**
Electric Railway Traction, p. 239, Supplt. to the Railv Gazette, February 4.
Main-line electric locomotives for New Zealand. (2 words & fig.)

1938 **621 .335 (.**
Electric Railway Traction, p. 243, Supplt. to the Railv Gazette, February 4.
British two-power electric locomotives. (1 000 wo & fig.)

Railway Magazine. (London.)

1938 **656 .222.1 (**
Railway Magazine, No. 488, February, p. 79.
North American railway speeds in 1937. (3 100 wo & tables.)

1938 **656 .222.1 (.**
Railway Magazine, No. 488, February, p. 87.
ALLEN (C. J.). — **British locomotive practice performance.** (5 200 words & fig.)

1938 **656 .212.5 (**
Railway Magazine, No. 488, February, p. 109.
SAMPSON (R. W.). — **The Edge Hill « gridiro marshalling sidings, Liverpool,** L. M. S. R. (3 000 wo & fig.)

1938 **621 .13 (09 (.4**
Railway Magazine, No. 488, February, p. 117.
Locomotive development in Austria. (3 100 word fig.)

8 **621 .131.1 (.44)**
ay Magazine, No. 488, February, p. 129.
sible streamlining of locomotives. (400 words.)

---

lway Mechanical Engineer. (New York.)

8 **621 .132.3 (.73) & 625 .232 (.73)**
ay Mechanical Engineer, No. 1, January, p. 1.
ding installs a light streamline train. (2 700 words
)

---

8 **621 .133.4 & 621 .133.5**
ay Mechanical Engineer, No. 1, January, p. 5 and
o. 2, February, p. 50.
CENT (H. S.). — The locomotive front end. (5 300
tables & fig.)

---

8 **621 .134.5 (.73)**
ay Mechanical Engineer, No. 1, January, p. 12.
e-feed oil lubrication. (1 400 words, tables & fig.)

---

8 **62. (01 & 621 .135.2**
ay Mechanical Engineer, No. 1, January, p. 15.
LLIAMS (F. H.). — Failures of locomotive parts.
words & fig.)

---

8 **625 .26 (.73)**
ay Mechanical Engineer, No. 1, January, p. 24.
building practice at the D. & H. shops. (2 000
& fig.)

---

8 **621 .132.3 (.73)**
ay Mechanical Engineer, No. 2, February, p. 43.
on Pacific heavy passenger locomotives. (2 900
& fig.)

---

8 **621 .118 (.73)**
ay Mechanical Engineer, No. 2, February, p. 54.
ual report of Bureau of Locomotive Inspection.
words & fig.)

Railway Signaling. (Chicago.)

3 **656 .254 (.73)**
ay Signaling, February, p. 83.
E (W. F.). — C. T. C. on complete subdivision of
rlington. (9 500 words & fig.)

---

3 **656 .254 (.73)**
y Signaling, February, p. 96.
ralized traffic control on the Denver & Rio Grande
n. (3 300 words & fig.)

---

3 **625 .162 (.73 & 656 .259 (.73)**
y Signaling, February, p. 101.
s protect three tracks. (2 000 words & fig.)

South African Railways and Harbours Magazine. (Johannesburg.)

1938 **621 .135 (01**
South African Railways & Harbours Magazine, January, p. 25.
Overturning tests. — Some notes on a particularly interesting phase of research work. (2 300 words & fig.)

1938 **621 .139 (.68, 625 .18 (.68 & 625 .27 (.68)**
South African Railways & Harbours Magazine, January, p. 33.
The scrap heap. (2 200 words & fig.)

The Oil Engine. (London.)

1938 **621 .43 (.944)**
The Oil Engine, N° 58, Mid-February, p. 310.
British diesel-engined trains for Australia. (1 700 words & fig.)

1938 **621 .392 (.42) & 621 .43 (.42)**
The Oil Engine, No. 58, Mid-February, p. 319.
A 400 h. p. oil-engined rail-welding plant. (1 000 words & fig.)

1938 **621 .43 (.73)**
The Oil Engine, No. 58, Mid-February, p. 322.
MANN (Ch. F. A.). — The world's largest oil-engined train. (1 000 words & fig.)

1938 **621 .43 (.54)**
The Oil Engine, No. 58, Mid-February, p. 326.
Four-car articulated trains for Ceylon. (1 500 words & fig.)

1938 **621 .43 (.73)**
The Oil Engine, No. 58, Mid-February, p. 336.
A novel diesel locomotive design. (300 words & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1937 **624 .63 (.45)**
Annali dei lavori pubblici, november, p. 909.
KRALL (G.). — Un'arcata di 90 metri sul torrente Biedano (Viterbo). (3 000 parole & fig.)

La tecnica professionale. (Firenze.)

1938 **621 .335 (.45)**
La tecnica professionale, febbraio, p. 25.
ELENA (S.). — Descrizione delle nuove elettromotrici AL e 79, AL e 88, AL e 40. (1 800 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1938 **625 .5 (.45)**

Rivista tecnica delle ferrovie italiane, 15 gennaio, p. 1.

NICOLOSI (F.). — La **funivia** S. Remo-M. Bignone. (7 500 parole & fig.)

1938 **625 .23**

Rivista tecnica delle ferrovie italiane, 15 gennaio, p. 25.

MONALDI (M.). — **Acustimetria** e mezzi usati **per ridurre i rumori** nell' interno delle vetture ferroviarie. (3 800 parole & fig.)

1938 **656 .257**

Rivista tecnica delle ferrovie italiane, 15 gennaio, p. 35.

JACHINO (C.). — La serratura meccanica nel **segnalamento ferroviario.** (2 700 parole & fig.)

Trasporti e lavori pubblici. (Roma.)

1937 **656 .23 (.3)**

Trasporti e lavori pubblici, dicembre, p. 381.

ARNAO (B.). — Il **traffico ferroviario** in Italia ed altrove. (2 000 parole, 4 tabellas & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

1938 **62. (01 &**

De Ingenieur, nr 5, 4 Februari, p. Bt. 11.

EMPERGER (F. von). — Die Rissbreite als Masz höher zulässigen **Spannungen.** (5 000 woorden & f

---

Spoor- en Tramwegen. (Utrecht.)

1938 **625 .1**

Spoor- en Tramwegen, nr 3, 1 Februar, p. 56.

NIJENHUIS (J.). — De **spoorschifter.** (800 woo & fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1938 **624. (.**

Gazeta dos caminhos de ferro, nº 1202, 16 de jan p. 45.

ZUZARTE DE MENDONÇA (A.). — A construçã **ponte sobre a Tejo** em frente de Lisboa. (1 800 pala & fig.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(MAY 1938)

16. 385. (02]

I. — BOOKS.

In French.

8 **016 .385 (.494)**

alogue de la Bibliothèque des Chemins de fer Fédé-suisses. 1er supplément, 1928-1937.

ne, Direction Générale des Chemins de fer Fédé-suisses. 1 brochure, 102 pages.

8 **691 & 721 .9**

ESTIER (V.).

cul et exécution des ouvrages en béton armé.

is, Dunod, 92, rue Bonaparte. 1 volume, 246 pages 5 figures. (Prix : 72 fr. français.)

In German.

8 **624 .2**

ER (G.).

nteilige Einflusslinien für durchlaufende Träger.

lin, Wilhelm Ernst & Sohn. 1 Band, 118 Seiten. : 10 RM.)

8 **621 .13**

Entwicklung der Lokomotive im Gebiete des ns mitteleuropaïscher Eisenbahnverwaltungen. 2. : 1880-1920.

chen und Berlin, R. Oldenbourg. 1 Band, 495 Sei-4 Zahlentafeln, 28 Bildtafeln und 492 Abbildungen. : 45 RM.)

8 **62. (01**

BER (H.).

bspannungslehre.

lin, Julius Springer. 1 Band, 160 Seiten, 106 Ab-gen. (Preis : 15 RM.)

7 **385 .14**

ER (Chr. W.).

junkturpolitik der Eisenbahnen.

tgart, Kohlhammer, W. 1 Band, Heft 10. (Preis : M.)

In English.

8 **526**

D (Ch.) and HOSMER (G. L.).

principles and practice of surveying. Volume I. ntary surveying.

New York : John Wiley & Sons Inc.

London : Chapman & Hall Limited, 11, Henrietta str., Covent Garden. 7 1/4 in. × 4 3/4 in. × 1 in. 717 pp. Illustrated. Folding plates. 20 s. net.

1938 **621 .392 & 721 .9**

CUEREL (J.)

Welding in reinforced concrete construction.

London : Reinforced Concrete Association, 91, Petty France, S. W. 1. (Price : 2 s. 6 d. net.)

1938 **0**

GUINLE (R. L.).

A modern spanish-english and english-spanish technical and engineering dictionary.

London : George Routledge and Sons, Limited. (Price : 15 s. net.)

1938 **721**

HICKERSON (T. F.).

Statically indeterminate frameworks.

Chapel Hill, North Carolina, U. S. A. : University of North Carolina Press. (Price : 14 s. net.)

1938 **388. (.42**

SEKON (G. A.).

Locomotion in Victorian London.

London : Oxford University Press, Milford. (Price : 12 s. 6 d.)

1938 **693**

The use of high alumina cement in structural engineering.

London : Institution of Structural Engineers, 10, Upper Belgrave-street, S. W. 1. (Price : 6 d. net.)

In Spanish.

1937 **385. (.82)**

SOARES (E. O.).

Ferrocarriles argentinos.

Buenos Aires, Congreso Sudamericano de Ferrocarriles de la República Argentina. 1 volumen, 206 páginas.

[1] The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress ently with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to ay Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 99).

[016. 385. (05]

II. — PERIODICALS.

In French.

Annales des Ponts et Chaussées (Paris).

1937 **62.** (01 & **627** .82

Annales des Ponts et Chaussées, novembre, p. 627.

TESAR (V.). — Compte rendu de l'étude des procédés photoélasticimétriques et leur application aux **barrages-voûtes.** (5 900 mots & fig.)

Bulletin de la Société d'encouragement pour l'industrie nationale. (Paris.)

1938 **385** .63

Bull. de la Soc. d'encouragement pour l'ind. nationale, mars, p. 98.

EGER (G.). — La **responsabilité en matière de transports de marchandises** par chemins de fer. Etude comparée entre la législation anglaise et la C. I. M. (11 700 mots.)

1938 **385** .113 (.73)

Bull. de la Soc. d'encouragement pour l'ind. nationale, mars, p. 143.

Les **chemins de fer** aux Etats-Unis d'Amérique en 1936. (1 400 mots.)

1938 **313** .385 (.47.42)

Bull. de la Soc. d'encouragement pour l'ind. nationale, mars, p. 147.

Statistique des Chemins de fer de l'Etat d'Estonie pour l'exercice 1936-37. (500 mots.)

Bulletin de l'Association française des amis des Chemins de fer. (Paris.)

1938 **621** .135 (01, **625** .22 & **625** .14 (01

Bull. de l'Assoc. française des amis des chem. de fer, février, p. 25.

MAUZIN. — La **stabilité des véhicules sur les voies ferrées** et la détermination des efforts qui s'exercent entre rails et roues. (3 500 mots & fig.)

Bulletin des transports internationaux par chemins de fer. (Berne.)

1938 **656** (.4)

Bull. des transp. intern. par ch. de fer, février, p. 78.

Coopération entre chemin de fer et automobile. (2 300 mots.)

1938 **385** .113 (.45)

Bull. des transp. intern. par ch. de fer, février, p. 85.

Les **Chemins de fer italiens** en 1935-1936. (1 200 mots.)

1938 **313** .385 (.4

Bull. des transp. intern. par ch. de fer, février, p.

Statistique des Chemins de fer néerlandais l'année 1936. (700 mots.)

Bulletin technique de l'Union professionnelle Inspecteurs techniques et des chefs de secti des chemins de fer belges. (Bruxelles.)

1938 **625** .1

Bull. tech. de l'Union profes. des Insp. tech. et des C de section des chem. de fer belges, février, p. 1.

LHOEST (L.). — Etude sur le **dispositif de ser** par clavettes. Système Ougrée-Marihaye. (4 200 mot fig.)

1938 **625** .122 & **625**

Bull. tech. de l'Union profes. des Insp. tech. et des C de section des chem. de fer belges, février, p. 1

THIBERT (J.). — Nouveau procédé d'**assèchemen de consolidation** de terrains sujets à éboulement. (6 mots & fig.)

Génie civil. (Paris.)

1938

Génie civil, n° 2897, 19 février, p. 165.

RAZOUS (P.). — L'**organisation** du travail par le tème Bedaux. (4 400 mots & fig.)

1938

Génie civil, n° 2897, 19 février, p. 172.

Propriétés des corps employés pour la **conserva des bois.** (1 100 mots.)

1938 **669**

Génie civil, n° 2898, 26 février, p. 186.

GUILLET (L.). — L'**acier calmé** et l'acier effervesc (3 400 mots.)

1938 **624**

Génie civil, n° 2900, 12 mars, p. 227.

MULS (F.) & PIRARD (A.). — La détermina des lignes d'influence dans les **poutres à treillis** croix de Saint-André. (3 000 mots & fig.)

1938 **625** .144.2 (.44) & **625** .171 (

Génie civil, n° 2900, 12 mars, p. 234.

Machine de la Compagnie des Chemins de fer l'Est, pour le **contrôle des courbes de la voie.** (1 mots & fig.)

L'Allégement dans les transports. (Lucerne

1937-38 **621** .132.6 (.436), **621** .43 (.4 & **625** .2 (.4

L'Allégement dans les transports, novembre-décem p. 146; janvier-février, p. 7.

LEHNER (A.). — Nouveau **matériel roulant pour** étroite des Chemins de fer Fédéraux autrichiens. (2 mots & fig.)

37 625 .2 & 669
égement dans les transports, novembre-décembre, . 155.
TTER (Dr. K.). — Quelques **applications récentes luminium** dans la construction du matériel roulant emins de fer. (1 700 mots & fig.)

38 621 .335 (.494)
égement dans les transports, janvier-février, p. 10.
JG (Ad.-M.). — Nouveau **matériel roulant léger** de ain de fer en Suisse. (1 000 mots & fig.) (A suivre.)

La Technique moderne. (Paris.)

38 621 .33 (.43)
Technique moderne, nº 4, 15 février, p. 111.
équipement électrique de la ligne Paris-Le Mans. 0 mots & fig.)

38 62. (01 & 669
Technique moderne, nº 5, 1er mars, p. 145.
AISSUS (J.) & PERSOZ (L.). — Les méthodes ernes d'**investigation des produits métallurgiques.** 0 mots & fig.)

38 691
Technique moderne, nº 5, 1er mars, p. 156.
AILLAUX. — La **protection des métaux ferreux** re la corrosion à l'aide de la peinture. (4 500 mots.)

38 621 .43
Technique moderne, nº 5, 1er mars, p. 179.
AUTRY (R.) & CHATEL (M.). — Les **automotrices** France et à l'étranger. Traction et exploitation. 0 mots & fig.)

38 621 .332 (.44)
Technique moderne, nº 6, 15 mars, p. 209.
spositif d'alimentation des caténaires de la gare lans. (3 000 mots & fig.)

La Traction électrique. (Paris.)

37 621 .33 (.44)
raction électrique, décembre, p. 191.
ERTRAND (L.) & NEVEUX (S.). — La **traction rique** sur la ligne de Culoz à Modane. (8 200 mots g.)

Chemins de fer et les Tramways. (Paris.)

37 621 .132.3 (.44)
Chemins de fer et les Tramways, juillet, p. 165.
comotives type Hudson 2-3-2 de la Compagnie du ain de fer du Nord. (900 mots & fig.)

37 621 .43
Chemins de fer et les Tramways, juillet, p. 167.
uveaux **moteurs Diesel pour la traction.** (900 mots g.)

1937 656 .212.5 & 656 .253
Les Chemins de fer et les Tramways, juillet, p. 170.
Signalisation des **buttes de triage.** (2 000 mots & fig.)

1937 625 .23
Les Chemins de fer et les Tramways, juillet, p. 172.
Perfectionnements aux **compartiments à couloir latéral.** (1 300 mots & fig.)

1937 621 .43
Les Chemins de fer et les Tramways, juillet, p. 174.
Limitation automatique de la puissance demandée à un **moteur à combustion interne.** (1 500 mots & fig.)

1937 621 .138.3
Les Chemins de fer et les Tramways, juillet, p. 176.
Appareil de lavage des locomotives. (1 200 mots & fig.)

1937 621 .133.4 & 621 .138.2
Les Chemins de fer et les Tramways, juillet, p. 177.
Extraction et utilisation du **fraisil.** (3 000 mots & fig.)

1937 621 .133.3
Les Chemins de fer et les Tramways, juillet, p. 181.
Surchauffeur à rayonnement pour locomotives. (1 200 mots & fig.)

1937 656
Les Chemins de fer et les Tramways, août-septembre, p. 187.
IXe Congrès de la Chambre de Commerce Internationale, Berlin, 28 juin au 3 juillet. — **Coordination air-fer.** (3 700 mots.)

1937 656. (.44)
Les Chemins de fer et les Tramways, août-septembre, p. 191.
La **coordination** des transports ferroviaires et routiers. (2 800 mots.)

1937 625 .215
Les Chemins de fer et les Tramways, août-septembre, p. 196.
Perfectionnements aux **bogies** à traverse danseuse pour automotrices. (2 700 mots & fig.)

1937 625 .212
Les Chemins de fer et les Tramways, août-septembre, p. 199.
Assemblage articulé entre essieu et châssis. (1 500 mots & fig.)

1937 625 .61 (01
Les Chemins de fer et les Tramways, octobre-novembre-décembre, p. 211.
HENNING (R.). — **Coordination** dans l'exploitation des grands chemins de fer et des chemins de fer économiques. (3 700 mots & fig.)

1937 621 .33 (.438)
Les Chemins de fer et les Tramways, octobre-novembre-décembre, p. 219.
KOWNACKI (C. de). — **L'électrification** des lignes de banlieue des Chemins de fer de l'Etat polonais. (3 200 mots & fig.)

1937 **665 .882**
Les Chemins de fer et les Tramways, octobre-novembre-décembre, p. 223.
La **soudure autogène** dans les chemins de fer. (2 500 mots.)

1937 **625 .214**
Les Chemins de fer et les Tramways, octobre-novembre-décembre, p. 225.
Boîte d'essieu à galets. (1 000 mots & fig.)

Les transports modernes. (Paris.)

1938 **621 .43 (.44)**
Les transports modernes, janvier-février, p. 57.
La **signalisation sonore des autorails** en France. (600 mots.)

L'Ossature métallique. (Bruxelles.)

1938 **625 .13 (.73)**
L'Ossature métallique, mars, p. 127.
WILKIN (G.-L.). — Le **Lincoln tunnel** sous l'Hudson à New-York. (1 700 mots & fig.)

1938 **62. (01**
L'Ossature métallique, mars, p. 132.
TEMMERMANN (F.) & BLANJEAN (L.). — Un problème de **résistance des matériaux** et de photo-élasticité. (1 800 mots & fig.)

Revue universelle des Mines. (Liége.)

1938 **385 .4 (.44)**
Revue universelle des mines, mars, p. 301.
MAGNÉE (P.). — La réorganisation du **régime des chemins de fer** en France. (1 700 mots.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

1938 **656 .225 & 656 .261**
Archiv für Eisenbahnwesen, März-April, S. 245.
SOMMERLATTE. — Entwicklung und Stand des **Behälterverkehrs.** (7 200 Wörter.)

1938 **385. (.3)**
Archiv für Eisenbahnwesen, März-April, S. 265.
KÜCHLER. — Die **Eisenbahnen** der Erde. (1 200 Wörter & Tabellen.)

1938 **623. (.43)**
Archiv für Eisenbahnwesen, März-April, S. 293.
MEINKE (B.). — Beiträge zur frühesten Geschichte des **Militäreisenbahnwesens.** (10 000 Wörter & Abb.)

1938 **656. (.43)**
Archiv für Eisenbahnwesen, März-April, S. 353.
HARDT. — Rückblick über das **deutsche Verkehrswesen** im Jahre 1937. (2 800 Wörter.)

1938 **656. (.**
Archiv für Eisenbahnwesen, März-April, S. 361.
WERNEKKE. — **Gleichschaltung der Verkehrsmi** in Frankreich. (6 600 Wörter.)

1938 **385. (09 (.497**
Archiv für Eisenbahnwesen, März-April, S. 379.
REMY. — Die **Bulgarischen Staatseisenbahnen** Häfen 1932 bis 1935. (8 300 Wörter & Abb.)

1938 **656 .211.7 (.**
Archiv für Eisenbahnwesen, März-April, S. 411.
BAUER (L.). — **Eisenbahn-Fähren im Güterverk** der amerikanischen Eisenbahnen. (3 400 Wörter & Ab

Die Lokomotive. (Wien.)

1938 **621 .132.3 (.**
Die Lokomotive, Februar, S. 17.
2 D 2-**Heissdampf-Schnellzuglokomotive** der Cana schen Nationalbahn. (1 400 Wörter & Abb.)

1938 **621 .132.6 (.43**
Die Lokomotive, Februar, S. 20.
1 B 1-**Heissdampf-Tenderlokomotive** Reihe 22 der k Ungarischen Staatseisenbahnen. (600 Wörter & Abb.

Die Reichsbahn. (Berlin.)

1938 **385 .517.6 (.4**
Die Reichsbahn, Heft 7, 16. Februar, S. 154.
GROSSART. — Der **Erweiterungsbau des Parksa** toriums Bad Homburg v. d. Höhe der **Reichsbahn-Ver** cherungs-anstalt. (1 300 Wörter & Abb.)

1938 **656**
Die Reichsbahn, Heft 8, 23. Februar, S. 174.
SPIESS (W.). — **Verkehrsleitung.** (12 700 Wörte

1938 **656 .1 (.4**
Die Reichsbahn, Heft 10, 9. März, S. 222.
LEUPOLD. — Das **Verkehrsrecht** für die Reichsau bahnen. (19 000 Wörter.)

1938 **656 .211 (.4**
Die Reichsbahn, Heft 11, 16. März, S. 250.
JÜSGEN. — Das neue Gesicht des **Kölner Hauptbah** hofes. (2 600 Wörter & Abb.)

Glasers Annalen. (Berlin.)

1938 **385. (06.4 (.4**
Glasers Annalen, Heft 2, 15. Januar, S. 13.
van HEES (H.). — Die **Eisenbahnfahrzeuge auf** Pariser Weltausstellung 1937. (3 800 Wörter & Abb.)

38 **625 .215**
rs Annalen, Heft 3, 1 Februar, S. 25; Heft 4, 15 Fe-
ruar, S. 43.
UMANN. — **Lauf von Eisenbahnfahrzeugen** mit
ohne Spiel gelagerten Radsätzen in der Geraden.
) Wörter & Abb.)

38 **385. (09 (.73)**
rs Annalen, Heft 3, 1. Februar, S. 30.
ERNEKKE. — Fortschritte im **Eisenbahnwesen** der
nigten Staaten von 1930 bis 1936. (3 600 Wörter.)

38 **621 .135.2 & 625 .14**
rs Annalen, Heft 4, 15. Februar, S. 37.
TERSEN (F.). — Stand der Entwicklung der **Rol-**
hslager in Schienenfahrzeugen. (4 800 Wörter &

n für die Fortschritte des Eisenbahnwesens. (Berlin.)

38 **621 .132.8 & 621 .43**
n für die Fortschr. des Eisenbahnwesens, Heft 4,
5. Februar, S. 63.
ETTCHER. — **Diesellokomotiven** grosser Leistung.
) Wörter & Abb.)

38 **621 .132.8**
n für die Fortschr. des Eisenbahnwesens, Heft 4,
5. Februar, S. 74.
UTTER (H.). — « Dampfmotivenanlage » für **tur-**
trischen Antrieb einer Lokomotive. (2 100 Wörter
b.)

8 **621 .132.8 (.44) & 621 .43 (.44)**
für die Fortschr. des Eisenbahnwesens, Heft 4,
5. Februar, S. 77.
ETTCHER. — Neue französische **Diesellokomoti-**
(1 900 Wörter & Abb.)

8 **621 .132.8 & 621 .43**
für die Fortschr. des Eisenbahnwesens, Heft 4,
5. Februar, S. 79.
ETTCHER. — **Diesellokomotive mit direktem An-**
(800 Wörter & Abb.)

8 **624 (.494) & 625 .13 (.494)**
für die Fortschr. des Eisenbahnwesens, Heft 5-6,
. März, S. 85.
ILER. — Der **Brückendienst** bei den Schweizeri-
Bundesbahnen. (5 600 Wörter & Abb.)

8 **624 .6 (.436)**
für die Fortschr. des Eisenbahnwesens, Heft 5-6,
März, S. 94.
N (R.). — **Unterhaltung gewölbter Brücken** bei
sterreichischen Bundesbahnen. (3 000 Wörter &

624 (.439) & 625 .13 (.439)
für die Fortschr. des Eisenbahnwesens, Heft 5-6,
März, S. 97.
ODITS (K.). — **Brückenunterhaltung** bei den
ch Ungarischen Staatseisenbahnen. (3 300 Wör-
Abb.)

1938 **624. (.43) & 625 .13 (.43)**
Organ für die Fortschr. des Eisenbahnwesens, Heft 5-6, 10. März, S. 102.
ROLOFF. — Die **Brückenunterhaltung** bei der Deutschen Reichsbahn. (5 700 Wörter & Abb.)

1938 **624**
Organ für die Fortschr. des Eisenbahnwesens, Heft 5-6, 10. März, S. 110.
BRODERSEN. — Rost und Rostschutz an **Stahlbrücken.** (3 600 Wörter.)

1938 **624. (.492) & 625 .13 (.492)**
Organ für die Fortschr. des Eisenbahnwesens, Heft 5-6, 10. März, S. 114.
MUNDT (Th. W.). — **Brückenunterhaltung** bei den Niederländischen Eisenbahnen. (3 300 Wörter & Abb.)

1938 **624. (.485) & 625 .13 (.485)**
Organ für die Fortschr. des Eisenbahnwesens, Heft 5-6, 10. März, S. 118.
Die **Instandhaltung der Brücken** bei den Schwedischen Staatsbahnen. (5 300 Wörter.)

Zeitschrift des Vereines deutscher Ingenieure (Berlin.)

1938 **621 .9**
Zeitschr. des Ver. deutsch. Ing., Nr. 9, 26. Februar, S. 219.
OPITZ (H.). — **Werkzeugmaschinen** der spanabhebenden Formung. (10 700 Wörter & Abb.)

1938 **621 .392**
Zeitschr. des Ver. deutsch. Ing., Nr. 9, 26. Februar, S. 241.
FAHRENBACH (W.). — Werkstoffsparen durch **Widerstandsschweissung.** (2 800 Wörter & Abb.)

1938 **621 .43**
Zeitschr. des Ver. deutsch. Ing., Nr. 11, 12. März, S. 321.
KRAEMER (O.). — **Wärmebeanspruchte Bauteile im Verbrennungsmotorenbau.** (3 300 Wörter & Abb.)

1938 **621 .87**
Zeitschr. des Ver. deutsch. Ing., Nr. 11, 12. März, S. 327.
WOESTE (Fr.). — **Eisenbahnwagen-Drehkran** mit 90 t. Tragkraft. (1 400 Wörter & Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungs- und Fernmeldewesen. (Berlin.)

1938 **656 .257**
Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 2, 1. Februar, S. 17.
HAMPKE. — **Mechanische Fahrstrassenfestlegesperre.** (1 900 Wörter & Abb.)

1938 **656 .256**

Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 2, 1. Februar, S. 20; Nr. 4, 10. März, S. 45.

BUDDENBERG (A.). — **Schienenstromschliesser.** (3 400 Wörter & Abb.)

1938 **656 .256**

Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 2, 1. Februar, S. 24; Nr. 4, 10. März, S. 49.

NITSCHKE. — Die **Streckenblockung** auf eingleisigen Bahnen. (4 300 Wörter & Abb.)

1938 **625 .151**

Zeitschr. für das ges. Eisenb.-Sicherungs- und Fernmeldewesen, Nr. 3, 20. Februar, S. 34.

HOCK (Ph.). — Wanderausgleichfähigkeit der **Spitzenverschlüsse.** (3 400 Wörter & Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1938 **656 .1 (.43)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 8, 24. Februar, S. 163.

BOOSS (H.). — Das neue **deutsche Reichsstrassenverkehrsrecht.** (9 200 Wörter.)

1938 **385 .3 (.494)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 9, 3. März, S. 181.

HESS (F.). — Die Revision der **Eisenbahngesetzgebung** in der Schweiz. (7 800 Wörter.)

1938 **656 .234 (.43)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 10, 10. März, S. 201.

FRITZE. — Die Flucht in die **Fahrpreisermässigungen.** (4 600 Wörter.)

1938 **385. (09 (.47)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 10, 10. März. S. 206.

SALLER. — 100 Jahre **russische Eisenbahnen.** (1 100 Wörter.)

1938 **385 .15 (.43)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 11, 17 März, S. 217.

GERTEIS. — Aus dem Leben einer Privatbahn zur **Verstaatlichung der Lübeck-Büchener Eisenbahn-Gesellschaft.** (4 900 Wörter.)

1938 **385 .585 (.43)**

Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 11, 17. März, S. 223.

MÜLLER-HILLEBRAND. — **Eisenbahnfilme** mit besonderer Berücksichtigung der Filmarbeit bei der Deutschen Reichsbahn. (2 100 Wörter.)

In English.

Bulletin, American Railway Engineering Association. (Chicago.)

1938 **625 .11 (.73**

Bulletin, American Railway Engineering Assoc., No. 40 February, p. 439.

Report of Committee XVI — **Economics of railway location.** Revision of manual. Spirals required f high speed operation. Grades and alinement throu tunnels. (17 000 words, tables & fig.)

1938 **656 .2 (.73**

Bulletin, American Railway Engineering Assoc., No. 40 February, p. 511.

Report of Committee XXI — **Economics of railway operation,** Methods for obtaining a more intensi use of existing railway facilities. Methods for dete mining most economical train length, etc. (15 000 wor & fig.)

1938 **385 .587 (.73) & 625 .17 (.7**

Bulletin, American Railway Engineering Assoc., No. 4 February, p. 561.

Report of Committee XXII — **Economics of railway labor.** Economies in labor to be effected through i creased capital expenditures. Effect of recent dev lopments in maintenance of way practices on gang o ganization, etc. (13 000 words.)

1938 **625 .144.4 (.73) & 625 .17 (.7**

Bulletin, American Railway Engineering Assoc., No. 40 February, p. 605.

Report of Committee XXVII — **Maintenance of w work equipment.** Depreciation of work equipment. Se contained direct blow gasoline tie tampers, etc. (9 0 words & fig.)

1938 **691. (.7**

Bulletin, American Railway Engineering Assoc., No. 4 February, p. 635.

Report of Special Committee on **waterproofing railway structures.** Specifications for **bituminous em sions for dampproofing.** (1 500 words.)

1938 **626. (.73) & 627. (.7**

Bulletin, American Railway Engineering Assoc., No. 4 February, p. 639.

Report of Committee XXV — **Waterways and harbo** Levees, dikes, mattresses, etc. (6 800 words.)

1938 **656 .237 (.7**

Bulletin, American Railway Engineering Assoc., No. 4 February, p. 655.

Report of Committee XI — **Records and accou** Office and drafting room practices. Construction repo and records, etc. (22 000 words & fig.)

ılletin, University of Illinois. (Urbana, III.)

37 621 .3
tin, University of Illinois, No. 27, November 30, . 5.
ITH (L. L.). — **Solution of electrical networks by ssive approximations.** (14 000 words & fig.)

Electrical Industries. (London.)

38 621 .18 (.42)
rical Industries, No. 3, March, p. 111.
ogress in generation. (1 500 words & tables.)

Engineer. (London.)

38 621 .131
neer, No. 4284, February 18, p. 184.
Y (L. H.). — **The analysis of locomotive test data.** 0 words & fig.)

38 62. (064 (.42)
neer, No. 4284, February 18, p. 187.
e British Industries Fair at Birmingham. (6 000 s & fig.)

38 621 .132.3 (.42)
neer, No. 4284, February 18, p. 191.
w G. W. R. 4-6-0 locomotives. (200 words & fig.)

38 621 .43 (.82)
neer, No. 4284, February 18, p. 199.
H. P. railcars for the Buenos Aires Pacific Rail- Company. (3 900 words & fig.)

38 62. (01 & 669 .1
neer, No. 4284, February 18, p. 204.
VINDEN (T.). — **Inspection as applied to iron and** (4 100 words.)

38 621 .116
neer, No. 4284, February 18, p. 206.
ELLANBY (A. L.). — **High pressure boilers.** (2 500 s.)

38 621 .43
neer, No. 4285, February 25, p. 228.
gh-speed oil engine for railcars. (1 100 words & fig.)

38 621 .165
neer, No. 4286, March 4, p. 238.
RISTIE (A. G.). — **Steam turbine construction** urope and America. (4 000 words.)

38 621 .43
neer. No. 4286, March 4, p. 239, and No. 4287, Iarch 11, p. 281.
ITH (C. W. R.). — **High supercharging in a C. I.** e. (8 000 words & fig.)

1938 62. (01
Engineer, No. 4286, March 4, p. 248.
Stiffness or flexure testers. (1 400 words & fig.)

1938 656 .254
Engineer, No. 4286, March 4, p. 253.
Railway signalling repeating system. (2 000 words & fig.)

1938 62. (01
Engineer, No. 4287, March 11, p. 267.
DICK (J.). — **A graphical method of analysis for torsional vibrations.** (2 000 words & fig.)

1938 621 .18
Engineer, No. 4287, March 11, p. 287.
FRISCH (M.). — **Trends in steam generator design.** (3 900 words & fig.)

1938 625 .4 (.47)
Engineer, No. 4287, March 11, p. 290.
The Moscow Underground Railways. (1 000 words.)

1938 62. (01 & 669 .1
The Metallurgist, p. 99, Supplt. to the Engineer, February 25.
The attack of superheated steam on steels. (3 200 words.)

1938 62. (01 & 669 .1
The Metallurgist, p. 103, Supplt. to the Engineer, February 25.
GREAVES (R. H.). — **Mass effect in some alloy steels.** (1 900 words, tables & fig.)

Engineering. (London.)

1938 62. (064 (.42)
Engineering, No. 3762, February 18, p. 167.
The British Industries Fair at Birmingham. (21 000 words & fig.)

1938 656 .213 (.45)
Engineering, No. 3762, February 18, p. 179.
Maritime Station at Naples. (1 300 words & fig.)

1938 621 .132.3 (.42)
Engineering, No. 3762, February 18, p. 189.
4-6-0 mixed-traffic locomotive, Great Western Railway. (600 words & fig.)

1938 621 .1 (01
Engineering, No. 3762, February 18, p. 192.
WALSHAW (A. C.). — **A method of analysis for trials on engineering plant.** (3 000 words & fig.)

1938 621 .335 (.54) & 621 .43 (.54)
Engineering, No. 3763, February 25, p. 205.
Articulated diesel-electric trains for the Ceylon Government Railway. (3 300 words & fig.)

1938 **656 .212.6 (.42) & 656 .213 (.42)**
Engineering, No. 3764, March 4, p. 225.
The handling of motor-car traffic at Dover. (2 900 words & fig.)

1938 **621 .43**
Engineering, No. 3764, February 25, p. 251.
The Humboldt-Deutz direct-drive diesel locomotive. (2 000 words.)

1938 **697 (.42)**
Engineering, No. 3765, March 11, p. 262.
The Drummond air-conditioning plant. (1 600 words & fig.)

Engineering News-Record. (New York.)

1938 **721 .3**
Engineering News Record, No. 7, February 17, p. 268.
BOLE (J. R.). — **Plotting column steel curves.** (800 words.)

1938 **62. (01 & 625 .13**
Engineering News Record, No. 7, February 17, p. 273.
BUTLER (M.). — **Concrete viaduct tested to destruction.** (2 000 words & fig.)

1938 **624 .2 (.73)**
Engineering News Record, No. 7, February 17, p. 339.
EASTERDAY (F. R.). — **Concrete box-girders of record span.** (2 500 words & fig.)

1938 **62. (01**
Engineering News Record, No. 7, February 17, p. 366.
BEGGS (G. E.) and TIMBY (E. K.). — **Interpreting data from strain rosettes.** (3 000 words & fig.)

1938 **624 .8 (.73)**
Engineering News Record, No. 7, February 17, p. 371.
GREENE (W. K.) and McKEEN (E. E.). — **Erecting the marine Parkway bridge.** (2 500 words & fig.)

1938 **62. (01 & 693**
Engineering News Record, No. 7, February 17, p. 374.
Concrete knowledge and practice. (4 100 words & fig.)

Journal, Institute of Transport. (London.)

1938 **38**
Journal, Institute of Transport, No. 5, March, p. 174.
SHERRINGTON (C. E. R.). — **Contrasts between British and foreign transport policies.** (8 200 words.)

1938 **656 .224**
Journal, Institute of Transport, No. 5, March, p. 182.
FENELON (K. G.). — **Suburban passenger transport problems.** (6 900 words.)

1938 **656. (.41)**
Journal, Institute of Transport, No. 5, March, p. 188.
CLARKE (D. L.). — **The Northern Ireland Road Transport Board.** (12 100 words.)

Journal, Institution of Civil Engineers. (London.)

1938 **62. (01 & 698. (.42**
Journal Institution of Civil Engineers, No. 5, Marc
p. 225.
FANCUTT (F.). — **The work of the paint researc laboratory** of the London, Midland and Scottish Rai way Company. (600 words.)

1938 **62. (01 & 66**
Journal, Institution of Civil Engineers, No. 5, Marc
p. 249.
The deformation and fracture of metals. (14 800 wor & fig.)

1938 **627. (.44**
Journal, Institution of Civil Engineers, No. 5, Marc
p. 291.
Dunkirk harbour extension works. (1 500 words.)

1938 **621 .135 (01 & 621 .135.**
Journal, Institution of Civil Engineers, No. 5, Marc
p. 295.
Some experiments on locomotive springs, with refe ence to bridge impact-allowances. (2 700 words & fig.

Journal, Permanent Way Institution. (London.

1937 **625 .211 & 656 .2**
Journal, Permanent Way Institution, December, p. 29
SHELDON (A. W.). — **Station and junction layout** (6 000 words & fig.)

1937 **656 .25 (**
Journal, Permanent Way Institution, December, p. 30
DYKE (A. W.). — **Elementary railway signalling** (6 600 words.)

1937 **62. (01 & 69**
Journal, Permanent Way Institution, December, p. 32
WOLSTENCRAFT (J.). — **Disintegration and deca of brickwork.** (2 900 words.)

1937 **625 .143 (.42) & 625 .144.4 (.42**
Journal, Permanent Way Institution, December, p. 32
HERBERT (C. C. B.). — The methods employe in **handling the first 120 foot rails rolled and lai** (4 600 words & fig.)

1937 **625 .12**
Journal, Permanent Way Institution, December, p. 34
SANDERS (J.). — **The drainage of permanent wa** (1 500 words.)

London & North Eastern Railway Magazine. (London.)

1938 **621 .132.8 (.42**
London & North Eastern Railway Magazine, No. March, p. 129.
STEDMAN (C. M.). — **Sentinel Cammell steam rai cars.** (1 900 words & fig.)

Mechanical Engineering. (New York.)

38 **62. (01**
anical Engineering, No. 3, March, p. 199.
RN (R. M.). — **Seeing the unseen.** (Massachusetts ute of Technology. (900 words & fig.)

38 **62. (01**
anical Engineering, No. 3, March, p. 205.
BOTT (E. J.), BOUSKY (S.) and WILLIAMSON E.). — The **profilometer.** A new instrument for apid measurement of surfaces. (8 300 words & fig.)

38 **621 .116**
anical Engineering, No. 3, March, p. 223.
OS (C. E.). — **Conditioning feedwater for steam ators.** (6 200 words & fig.)

Modern Transport. (London.)

38 **385 .15**
rn Transport, No. 988, February 19, p. 4.
tionalisation of transport. No. 4 — Road and rail.) words.)

38 **656 .211 (.42)**
rn Transport, No. 988, February 19, p. 5.
construction of Southern Railway suburban sta- (1 900 words & fig.)

38 **621 .33 (.42)**
rn Transport, No. 988, February 19, p. 6.
ctrification of Southern Railway. (600 words.)

38 **621 .43 (.54)**
rn Transport, No. 988, February 19, p. 13.
v high-speed oil-engine for rail traction. Success- English Electric » unit installed in Ceylon Govern- trains. (1 100 words & fig.)

38 **623 (.42)**
rn Transport, No. 988, February 19, p. 17.
raid precautions in City transport. (2 200 words .)

38 **621 .132 (.73)**
rn Transport, No. 988, February 19, p. 20.
eamlining U. S. A. locomotives. (700 words & fig.)

38 **656 .227**
rn Transport, No. 988, February 19, p. 21.
LSON (A. R.). — **Exceptional loads.** (1 200 words .)

38 **656 .23 & 659**
rn Transport, No. 989, February 26, p. 2.
ilway publicity. (1 100 words.)

38 **385 .11 (.42)**
rn Transport, No. 989, February 26, p. 3.
lway results for 1937. (1 000 words & tables.)

1938 **656 .25 (0**
Modern Transport, No. 989, February 26, p. 4.
CROOK (G. H.). — **Railway signal engineer** and his duties. (2 300 words.)

1938 **621 .33 (.44) & 625 .4 (.44)**
Modern Transport, No. 989, February 26, p. 5.
Underground railways of Paris. (2 100 words & fig.)

1938 **625 .61 (0**
Modern Transport, No. 989, February 26, p. 6.
Position of light railways. (700 words.)

1938 **659. (.42)**
Modern Transport, No. 989, February 26, p. 8.
Transport publicity. (1 700 words.)

1938 **385 .586 (.42)**
Modern Transport, No. 989, February 26, p. 9.
MANTON (Colonel L.). — **Training of railway staff.** (1 700 words.)

1938 **385. (072)**
Modern Transport, No. 989, February 26, p. 11.
CORBLE (O. H.). — **Railway research.** Growing need for experiment to secure operating economies. (1 800 words.)

1938 **385. (091 (.5)**
Modern Transport, No. 990, March 5, p. 4.
Trough trains to Baghdad. (1 700 words & 1 map.)

1938 **621 .33 (.45) & 625 .62 (.45)**
Modern Transport, No. 990, March 5, p. 6.
Tramcar development in Italy. Uni-directional units for service in Milan. New methods in body building. (1 000 words & fig.)

1938 **656 .225 (.42)**
Modern Transport, No. 990, March 5, p. 8.
Potatoes by rail. Bulk conveyance and prompt delivery. (900 words.)

1938 **621 .338 (.73)**
Modern Transport, No. 990, March 5, p. 9.
Double-deck train for Long Island Railroad. (800 words & fig.)

1938 **621 .33 (.81)**
Modern Transport, No. 990, March 5, p. 10.
Railways in Brazil. Progress of electrification. (700 words.)

1938 **621 .331 (.54)**
Modern Transport, No. 990, March 5, p. 11.
Glass bulb rectifiers in India. (1 600 words & fig.)

1938 **656 .1 (.42)**
Modern Transport, No. 991, March 12, p. 3.
Grouping in road transport. (1 900 words.)

1938 **656 .1 & 656 .261**
Modern Transport, No. 991, March 12, p. 4.
TILLING (R. H.). — **Costing for freight transport.** (1 800 words.) (To be continued.)

1938 **621 .335 (.73)**
Modern Transport, No. 991, March 12, p. 5.
Diesel-electric trains in United States. (1 000 words & fig.)

1938 **385 .15 (.42)**
Modern Transport, No. 991, March 12, p. 7.
Nationalisation of transport. (2 100 words.)

Proceedings, American Society of Civil Engineers. (New York.)

1938 **336 .1**
Proc., Amer. Soc. Civil Eng., No. 2, February, p. 225.
Engineering economics and public works. A symposium. Advantages of ordely planning, by F. H. Fay. (9 000 words.)
Influence of public opinion, by D. W. Mead. (8 000 words.)
Hazards of uneconomical construction, by H. E. Riggs. (8 000 words.)
An appeal to reason, by W. J. Wilgus. (6 000 words.)

1938 **721 .1**
Proc., Amer. Soc. Civil Eng., No. 2, February, p. 311.
VETTER (C. P.). — **Design of pile foundations.** (7 000 words, tables & fig.)

1938 **385 .2**
Proc., Amer. Soc. Civil Eng., No. 2, February, p. 354.
Water transportation versus rail transportation. (1 500 words.)

Railway Age. (New York.)

1938 **625 .213 (.73), 625 .215 (.73) & 625 .232 (.73)**
Railway Age, No. 7, February 12, p. 294.
New pendulum-type cars tested. (1 900 words & fig.)

1938 **621 .43 (.73)**
Railway Age, No. 7, February 12, p. 296.
Diesels handle Birmingham's steel. (1 500 words & fig.)

1938 **625 .13 (.73)**
Railway Age, No. 7, February 12, p. 299.
New trusses reinforce old ones in Santa Fe bridge. (1 300 words & fig.)

1938 **621 .33 (.73)**
Railway Age, No. 8, February 19, p. 332.
Pennsylvania extends electrification to Harrisburg. (4 700 words & fig.)

1938 **621 .132.3 (.73**
Railway Age, No. 8, February 19, p. 345.
Lackawanna receives **high-speed passenger locomo**tives. (1 200 words & fig.)

1938 **625 .143.5 (.73) & 656 .281 (.73**
Railway Age, No. 8, February 19, p. 348.
Derailment on concrete roadbed caused by brakin bolts. (1 300 words & fig.)

1938 **656 .254 (.73) & 656 .255 (.73**
Railway Age, No. 9, February 26, p. 366.
ZANE (W. F.). — **C. T. C. on complete subdivisio** of the Burlington. (3 800 words & fig.)

1938 **625 .232 (.73**
Railway Age, No. 9, February 26, p. 372.
Missouri-Kansas-Texas places **new passenger cars i** service. (2 100 words & fig.)

1938 **625 .214 (.73**
Railway Age, No. 9, February 26, p. 375.
Miller Felpax lubricator. (700 words & fig.)

1938 **624 .8 (.73**
Railway Age, No. 9, February 26, p. 376.
Double-span lift bridge completes unusual six-trac river crossing. (5 400 words & fig.)

1938 **656 .212.6 (.73) & 625 .225 (.73**
Railway Age, No. 9, February 26, p. 382.
Hauling Cincinnati's marchandise. (1 200 words & fig

1938 **656 .211.6 (.73**
Railway Age, No. 9, February 26, p. 384.
Train-connection buses operate across Bay bridg (800 words & fig.)

1938 **656 .1 (.73**
Railway Age, No. 9, February 26, p. 386.
Seasonal operations successful. — Union Pacific serv several national parks with motor transport and ho system. (1 000 words & fig.)

1938 **621 .138 (.73) & 621 .39 (.7**
Railway Age, No. 10, March 5, p. 405.
Rock Island saves money by electrifying termina (3 400 words & fig.)

1938 **621 .392 (.73) & 625 .2**
Railway Age, No. 10, March 5, p. 408.
WILLOUGHBY (V. R.). — **Welding of railroad r** ling stock. (3 100 words.)

1938 **385 .59 (.73) & 656 .22**
Railway Age, No. 10, March 5, p. 418.
SILLCOX (L. K.). — **Short trains increase hazar** (3 500 words.)

Railway Engineering and Maintenance. (Chicago.)

38 **625 .144.4 (.73)**
way Engineering and Maintenance, March, p. 164.
here are we heading in **the use of work equipment.**
0 words & fig.)

---

38 **385 .587 & 625 .17**
way Engineering and Maintenance, March, p. 166.
e specialized gang — What is its justification ?
0 words & fig.)

---

38 **625 .144.4**
way Engineering and Maintenance, March, p. 169.
aking work equipment. (3 500 words.)

---

38 **625 .144.4 & 625 .17**
way Engineering and Maintenance, March, p. 172.
cking up the bridge and building forces. (3 200
s & fig.)

---

38 **385 .587 & 625 .144.4**
way Engineering and Maintenance, March, p. 178.
achines and men. (2 200 words.)

---

38 **625 .122, 625 .144.4 & 625 .172**
way Engineering and Maintenance, March, p. 180.
awler equipment. — An answer to present day
s. (5 500 words & fig.)

Railway Gazette. (London.)

38 **621 .13 (.42) & 669 (.42)**
way Gazette, No. 7, February 18, p. 303 and No. 8,
February 15, p. 366.
e metallurgy of a high-speed locomotive — I. (6 900
s & fig.)

---

38 **625 .144.4 (.436)**
way Gazette, No. 7, February 18, p. 312.
loading tackle for long rails in Austria. (300 words
.)

---

38 **621 .93 (.42) & 665 .882 (.42)**
way Gazette, »o. 7, February 18, p. 313.
new universal frame-cutting machine. (500 words
.)

---

38 **656 .23 (.42) & 659 (.42)**
way Gazette, No. 8, February 25. p, 359.
YNE (H. W.). — **Traffic research,** Great Western
ay. (1 800 words.)

---

38 **656 .25 (0**
way Gazette, No. 8, February 25, p. 361.
OOK (G. H.). — Considerations on **the work of the**
engineer. (4 300 words & fig.)

---

38 **621 .132.3 (.481)**
ay Gazette, No. 8, February 25, p. 371.
w four-cylinder 2-8-4 locomotives for Norway.
words & fig.)

1938 **621 .91 (.42)**
Railway Gazette, No. 8, February 25, p. 372.
Machining horn gaps in locomotive frames. (300 words & fig.)

1938 **621 .33 (.42)**
Railway Gazette, No. 8, February 25, p. 385.
Great Western Railway — **Penzance electrification investigation.** (600 words & 1 map.)

1938 **659. (.42)**
Railway Gazette, No. 8, February 25, p. 386.
Transport publicity. (2 200 words.)

1938 **385 .586**
Railway Gazette, No. 8, February 25, p. 388.
Colonel **Manton** on the **training of railway staff.** (1 600 words.)

1938 **621 .13 (09 (.4)**
The Railway Gazette, No. 9, March 4, p. 409.
DIAMOND (E. L.). — **The locomotive in central Europe.** (1 800 words.)

1938 **656 .254 (.42) & 654 (.42)**
The Railway Gazette, No. 9, March 4, p. 410 and No. 10, March 11, p. 470.
Teleprinter progress on the L. N. E. R. (2 100 words.)

1938 **625 .14 (09 (.931)**
The Railway Gazette, No. 9, March 4, p. 412.
Wooden rails in New Zealand. (1 100 words & fig.)

1938 **656 .29**
The Railway Gazette, No. 9, March 4, p. 413.
The Wiesinger system of high-speed rail transport. (300 words & fig.)

1938 **621 .133.7 (.42)**
The Railway Gazette, No. 9, March 4, p. 414.
Water softening on the L. N. E. R. (700 words & fig.)

1938 **656 .254 (.44) & 656 .256.3 (.44)**
The Railway Gazette, No. 9, March 4, p. 416.
WALTER (J. G.). — **Automatic block and cab signalling in France.** (1 700 words & fig.)

1938 **621 .132.8 (.62)**
The Railway Gazette, No. 9, March 4, p. 419.
New Sentinel locomotives for the Egyptian State Railways. (1 900 words & fig.)

1938 **625 .111**
Railway Gazette, No. 10, March 11, p. 469.
Track layouts for station approaches. (900 words & fig.)

1938 **656 .1 (.42)**
Railway Gazette, No. 10, March 11, p. 473.
LEE (Ch. E.). — **Organisation of the bus industry** in England and Wales. (3 000 words.)

1938 **624.** (0 & **691**
Railway Gazette, No. 10, March 11, p. 483.
An efficient waterproofing for bridge decks. (500 words & fig.)

1938 **625** .174 (.481)
Railway Gazette, No. 10, March 11, p. 485.
Snow ploughs, Norwegian State Railways. (500 words & fig.)

1938 **621** .43 (.43)
Diesel Railway Traction, p. 330, Supplt. to the Railway Gazette, February 18.
Direct-drive main-line diesel locomotive. (2 100 words & fig.)

1938 **621** .43 (.498)
Diesel Railway Traction, p. 334, Supplt. to the Railway Gazette, February 18.
Fast twin-car trains in Roumania. (500 words & fig.)

1938 **621** .43 (.54)
Diesel Railway Traction, p. 385, Supplt. to the Railway Gazette, February 18.
Diesel trains for Ceylon. (600 words & fig.)

1938 **621** .43 (.43)
Diesel Railway Traction, p. 336, Supplt. to the Railway Gazette, February 18.
New design of diesel-electric train in Germany. (2 000 words & fig.)

1938 **621** .43 (.82)
Diesel Railway Traction, p. 342, Supplt. to the Railway Gazette, February 18.
Railcars for the foothills of the Andes. (700 words & fig.)

1938 **621** .33 (.81)
Diesel Railway Traction, p. 446, Supplt. to the Railway Gazette, March 4.
Electrification of the Central Railway of Brazil. (7 800 words & fig.)

Railway Magazine. (London.)

1938 **656** .222.1 (.42)
Railway Magazine, No. 489, March, p. 161.
British express trains in 1937. (1 700 words & tables.)

1938 **621** .33 (.494) & **625** .3 (.494)
Railway Magazine, No. 489, March, p. 177.
Electrification of the Rigi Railway. (1 000 words & fig.)

1938 **625** .232 (.42)
Railway Magazine, No. 489, March, p. 185.
ELLIS (C. H.). — **Royal trains.** III — The L.M.S.R. (3 000 words & fig.)

1938 **621** .132.3 (.44
Railway Magazine, No. 489, March, p. 199.
Evolution of the P. L. M. Pacific. (800 words & fig

Railway Mechanical Engineer. (New York.)

1938 **621** .133.4 & **621** .133.
Railway Mechanical Engineer, No. 3, March, p. 85.
VINCENT (H. S.). — A study, based on laborator results of **the locomotive front end.** (2 100 words & fig.

1938 **621** .43 (.73
Railway Mechanical Engineer, No. 3, March, p. 88.
Diesel electric switchers. (1 100 words & fig.)

1938 **625** .25
Railway Mechanical Engineer, No. 3, March, p. 89.
McCUNE (J. C.). — **The stopping of trains.** (4 80 words.)

1938 **621** .132.3 (.73
Railway Mechanical Engineer, No. 3, March, p. 93.
Santa Fe **high-speed passenger locomotives.** (3 20 words & fig.)

Railway Signaling. (Chicago.)

1938 **621** .33 (.73) & **656** .25 (.73
Railway Signaling, March, p. 137.
Pennsylvania electrification signaling. (3 500 words fig.)

1938 **656** .258 (.42
Railway Signaling, March, p. 142.
Relay interlocking at Leeds. (2 600 words & fig.)

1938 **656** .258 (.73) & **656** .259 (.73
Railway Signaling, March, p. 146.
Highway crossing protection and spring switch o Milwaukee. (1 600 words & fig.)

1938 **313 : 656** .259 (.73) & **313 : 656** .286 (.73
Railway Signaling, March, p. 148.
Iowa grade crossing accidents. (800 words.)

1938 **621** .39 (.73) & **656** .256 (.73
Railway Signaling, March, p. 149.
Primary battery for light signals. (1 500 words & fig.

1938 **625** .162 (.73) & **656** .259 (.73
Railway Signaling, March, p. 152.
Barriers on the Boston & Maine. (2 600 words & fig.

1938 **656** .258 (.73
Railway Signaling, March, p. 155.
Junction and end-of-double-track protected on Centra of Georgia. (1 900 words & fig.)

African Railways and Harbours Magazine. (Johannesburg.)

8 **625 .232 (.68) & 656 .224 (.68)**
African Railways & Harbours Magazine, Februa-, p. 145.
« **Union Limited** » **train.** (2 500 words & fig.)

The Locomotive. (London.)

8 **621 .132.8**
ocomotive, No. 546, February 15, p. 31.
ers for railcars. (1 000 words.)

---

8 **621 .132.3 (.42)**
ocomotive, No. 546, February 15, p. 32.
uilt 4-6-0 type engine, No. 2364, L. N. E. R. (500 & fig.)

---

8 **621 .132.3 (.71)**
ocomotive, No. 546, February 15, p. 34.
4 express locos, Canadian Pacific Railway. (700 & fig.)

---

8 **621 .335 (.931)**
ocomotive, No. 546, February 15, p. 35.
ctric loco, New Zealand Government Railways. words & fig.)

---

8 **621 .335 (.494) & 621 .338 (.494)**
ocomotive, No. 546, February 15, p. 37.
h-speed electric trains, Swiss Federal Railways. words & fig.)

---

8 **385. (091 (.51)**
ocomotive, No. 546, February 15, p. 45.
rehabilitation of China's Railways. (2 600 words).

---

8 **621 .335 (.54) & 621 .43 (.54)**
ocomotive, No. 546, February 15, p. 48.
electric trains for Ceylon. (4 400 words & fig.)

---

8 **625 .232 (.42)**
ocomotive, No. 546, February 15, p. 54.
carriages, Great Southern Railways. (700 words)

---

8 **621 .9 (.42)**
ocomotive, No. 546, February 15, p. 55.
ebox boring, facing and radiusing machine. (1 100 & fig.)

---

8 **621 .132.4 (.42)**
ocomotive, No. 546, February 15, p. 58.
freight engines, Southern Railway. (400 words)

---

8 **621 .335 (.944) & 621 .43 (.944)**
ocomotive, No. 546, February 15, p. 59.
engined trains for New South Wales. (1 600 words)

1938 **621 .132.3 (.42)**
The Locomotive, No. 547, March 15, p. 66.
G. W. R. « Manor » class, 4-6-0 mixed traffic engines. (400 words & fig.)

1938 **621 .132.3 (.73)**
The Locomotive, No. 547, March 15, p. 67.
New **express (4-6-4) locos.,** Atchinson, Topeka & Santa Fe Railway. (600 words & fig.)

1938 **621 .132.3 (.51)**
The Locomotive, No. 547, March 15, p. 68.
« **Pacific** » **type locomotives,** Chinese Govt. Railways, Lung-Hai line. (500 words & fig.)

1938 **621 .132.5 (.44)**
The Locomotive, No. 547, March 15, p. 69.
2-10-2 freight locomotives, Alsace-Lorraine Rys. (600 words & fig.)

1938 **621 .132.5 (.43)**
The Locomotive, No. 547, March 15, p. 70.
2-8-2 fast freight locomotive, German National Rys. (500 words & fig.)

1938 **621 .13 (0 & 621 .138**
The Locomotive, No. 547, March 15, p. 73.
PHILLIPSON (E. A.). — **The steam locomotive in traffic.** (2 600 words.)

1938 **621 .335 (.931) & 621 .338 (.931)**
The Locomotive, No. 547, March 15, p. 75.
Electric trains, New Zealand Govt. Railways. (1 700 words & fig.)

1938 **621 .132.1 (.42)**
The Locomotive, No. 547, March 15, p. 77.
MORRIS (O. J.). — **Standardising Southern Railway locomotives,** Central Section. (2 400 words & fig.)

1938 **625 .23 (0**
The Locomotive, No. 547, March 15, p. 80.
Steel and wood in railway coach construction. (1 200 words.)

1938 **621 .132.1 (.41)**
The Locomotive, No. 547, March 15, p. 83.
REED (K. H.) and FAYLE (H.). — **Recent developments of Irish locomotive practice,** Great Southern Railways. (1 600 words & fig.)

1938 **621 .135 (01 & 624**
The Locomotive, No. 547, March 15, p. 86.
Institution of Locomotive Engineers. Counterbalancing and its effect on the locomotives and on the bridges. (2 100 words.)

1938 **621 .13 (0**
The Locomotive, No. 547, March 15, p. 88.
TUPLIN (W. A.). — **Mixed traffic locomotives.** (1 600 words.)

1938 **621 .16 (.42) & 625 .3 (.42)**
The Locomotive, No. 547, March 15, p. 91.
Incline working on L. M. S. R. (1 700 words & fig.)

1938 **621 .13 (091)**
The Locomotive, No. 547, March 15, p. 93.
Famous locomotive engineers. IV — Archibald Sturrock. (4 200 words & fig.)

1938 **621 .134.5 & 621 .89**
The Locomotive, No. 547, March 15, p. 96.
Lubrication and lubricants. (1 400 words.)

The Oil Engine. (London.)

1938 **621 .43**
The Oil Engine, No. 59, March, p. 345.
The development of diesel-engined railcars. (1 300 words.)

1938 **621 .43 (.73)**
The Oil Engine, No. 59, March, p. 350.
The second 5 400 B. H. P. streamline train. (300 words & fig.)

1938 **621 .43 (.82)**
The Oil Engine, No. 59, March, p. 361.
Oil-engined railcars for South America. (500 words & fig.)

1938 **621 .43 (.45)**
The Oil Engine, No. 59, March, p. 362.
Diesel rail traction in Italy. (400 words & fig.)

Transit Journal. (New York.)

1938 **625 .214**
Transit Journal, No. 3, March, p. 102.
DEAN (J. S.). — **Reconditioning anti-friction bearings.** (1 300 words & fig.)

In Spanish.

Boletín de la Asociación internacional permanente del Congreso Sudamericano de ferrocarriles. (Buenos Aires.)

1937 **656. (.42)**
Boletín de la Asoc. internacional perm. del Congr. Sudamer. de ferrocarriles, octubre-diciembre, p. 15.
CALDER AUGEL (J.). — **Los ferrocarriles britanicos y el transporte carretero.** (3 600 palabras.)

1937 **656 .254**
Boletín de la Asoc. internacional perm. del Congr. Sudamer. de ferrocariles, octubre-diciembre, p. 23.
BUNGE (A. E.). — **El desarrollo del automovilismo y los pasos a nivel.** (1 800 palabras.)

1937 **621 .43 (.**
Boletín de la Asoc. internacional perm. del Congr. S amer. de ferrocarriles, octubre-diciembre, p. 77.
Coches motores Diesel del Ferrocarril Central Arg tino. (4 000 palabras & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1937 **624.**
Annali dei lavori pubblici, dicembre, p. 1014.
SALVATI (M.). — **La lastra piana rettangolare** carico uniforme vincolata lungo tre lati. (3 300 paro

---

1938
Annali dei lavori pubblici, gennaio, p. 51.
MARTINO (V. de). — **La nuova stazione di Cu** e le sue linee di accesso. (3 400 parole & fig.)

La tecnica professionale. (Firenze.)

1938 **625**
La tecnica professionale, marzo, p. 49.
MONALDI (M.). — **Mezzi usati per ridurre i rum** nell'interno delle vetture ferroviarie. (2 200 parole fig.)

1938 **625 .251 (.4**
La tecnica professionale, marzo, p. 58.
Nuovo robinetto F. S. di « tipo L. » per il coman del freno automatico. (2 000 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.

1938 **625 .19 (.**
Revista tecnica delle ferrovie ital., 15 febbraio, p.
GOTELLI (R.). — **La piena del Tevere** (dicemb 1937 = XVI) e le sue ripercussioni sull' esercizio roviario. (1 900 parole & fig.)

1938 **625 .251 (.**
Revista tecnica delle ferrovie ital., 15 febbraio, p.
FASOLI. — **Il freno per alta velocità** dei veicoli d F. F. S. S. (4 800 parole & fig.)

Trasporti e lavori pubblici. (Roma.)

1938 **6**
Trasporti e lavori pubblici, gennaio, p. 10.
ARNAO (B.). — **I « Raggruppamenti » risolvon problema della concorrenza ?** (3 500 parole & fig.)

In Dutch.

De Ingenieur. (Den Haag.)

938 669 .1
Ingenieur, Nr 2, 18 Februari, p. Mk. 7; Nr 3, 18 Maart, p. Mk. 13.
ALM. — **Warmtebehandeling van staal.** (8 700 woor- & fig.)

938 621 .89
Ingenieur, Nr 8, 25 Februari, p. P. 1.
OUMAN (C. A.) & BLOK (H.). — Symposium over eering en smeermiddelen. (6 300 woorden.)

938 625 .4 (.493)
Ingenieur, Nr 9, 4 Maart, p. B. 41.
RANCHIMONT (E.). — Les grands travaux de la tion Nord-Midi à Bruxelles. (7 800 woorden & fig.)

938 691 & 721 .9
Ingenieur, Nr 3, 4 Maart, p. Bt. 23.
AN LOGHEM (J. R.). — **Architectuur en beton.** 00 woorden.)

Spoor- en Tramwegen. (Utrecht.)

938 621 .392 (.492) & 624 .8 (.492)
or- en Tramwegen, Nr. 4, 15 Februari, p. 79.
OEST (A. H.). — **Electrisch laschwerk** bij de her- ing van de draaibrug over de Hoogeveensche Vaart Meppel. (2 200 woorden & fig.)

938 385. (09 (.439)
or- en Tramwegen, Nr 4, 15 Februari, p. 85.
LEX. — De **Koninklijke Hongaarsche Staatspoor- gen** in de laatste twee verslagjaren. (700 woorden &

938 656 .211 (.492) & 725 .31 (.492)
or- en Tramwegen, Nr 5, 1 Maart, p. 101.
e **nieuwe stations** te Amsterdam-Oost. (2 100 woor- & fig.)

938 624 .32 (.92)
or- en Tramwegen, Nr 5, 1 Maart, p. 106.
OEPADIO (R.). — **Verwisseling van de Tjitarœm- g.** (2 500 woorden & fig.)

938 656
or- en Tramwegen, Nr 6, 15 Maart, p. 125.
e algemeene Nederlandsche Verkeersfederatie over erkeersevolutie en Overheid ». (3 800 woorden.)

1938 624 .32 (.92)
Spoor- en Tramwegen, Nr 6, 15 Maart, p. 129.
SOEPADIO (R.). — **Verwisseling van de Tjitaroem- brug.** (2 600 woorden & fig.)

In Polish.

(= 91.885)

Inżynier Kolejowy. (Warszawa).

1938 621 .133.1 = 91 .885
Inzynier Kolejowy, No. 2, p. 54.
OGUREK (O.). — **Traction methods and fuel problems** with special reference to the needs of the Polish State Railways. (9 000 words & fig.)

1938 621 .131.3 = 91 .885
Inzynier Kolejowy, No. 2, p. 67.
FELSZ (S). — **New devices used on locomotives** and tests of such devices. (3 500 words.)

1938 621 .392 (.438) = 91 .885
& 625 .17 (.438) = 91 .885
Inzynier Kolejowy, No. 2, p. 71.
NOWAK (T.). — **Welding applied to maintenance work in the Way and Works Department** of the Polish State Railways. (4 800 words & fig.)

1938 621 .133.4 = 91 .885
Inzynier Kolejowy, No. 3, p. 96.
MADEYSKI (J.). — **Defects of smoke consuming devices** now in service on steam locomotives. (6 800 words & fig.)

1938 625 .5 (.438) = 91 .885
Inzynier Kolejowy, No. 3, p. 105.
RAABE (E.). — The Krynica **funicular railway.** (4 800 words & fig.)

In Portuguese.

Gazeta dos caminhos de ferro. (Lisboa.)

1938 385 .1
Gazeta dos caminhos de ferro, n° 1204, 16 de fevereiro, p. 87.
SOUZA (J. F. de). — **Caminhos de ferro em crise.** (3 800 palavras.)

1938 385. (09 (.67)
Gazeta dos caminhos de ferro, n° 1206, 16 de março, p. 135.
GALVAO (A. L.). — **Caminhos de ferro de Moçambique.** (4 000 palavras.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

MONTHLY BIBLIOGRAPHY OF RAILWAYS [1].

PUBLISHED UNDER THE SUPERVISION OF

P. GHILAIN,

General Secretary of the Permanent Commission of the International Railway Congress Association.

(JUNE 1938)

16. 385. (02]

I. — BOOKS.

In French.

8 625 .122 & 625 .123

ERT (J.).

nage de terrains humides et exposé d'un procédé au de consolidation de terrains sujets à glissement boulement.

xelles, Union Professionnelle des Inspecteurs tech- et des Chefs de Section de la S. N. C. F. B. hure, 46 pages et figures.

In German.

8 62. (08

ER (A.).

-I-Jahrbuch 1938. Die Chronik der Technik.

in, V-D-I-Verlag. 1 Band, 312 Seiten. (Preis : .M.)

7 621 .43

ER (F.).

el- und Treibgasmotoren.

chen und Berlin, R. Oldenbourg. 1 Band. (Preis : .M.)

In English.

8 621 .43 (02

RSON (J. W.).

el operator's manual.

don : McGraw-Hill Publishing Company, Ltd., ych House, W. C. 2. (Price : 15 s. net.)

8 624

TOE (C. S.) and ADAMS (H C.).

nforced concrete bridge design. Second edition. d and enlarged.

don : Chapman and Hall Limited. (Price : 42 s.

8 621 .43

ER (H. E.).

rnal-combustion engines. Theory, design, analysis, ation, performance and economics.

York : John Wiley and Sons, Incorporated.

don : Chapman and Hall, Ltd. (Price : 20 s. net.)

1938 62. (01 (06 (.73)

Index to A. S. T. M. Standards and Tentative Standards — Jan. 1. 1938.

Philadelphia, Pa. : American Society for Testing Materials, 260, S. Broad Street, 128 pages.

1937 62. (01 (06 (.73)

Proceedings of the fortieth annual meeting, American Society for Testing Materials. Vol. 37, 1937; Part I, Committee Reports, Tentative Standards; Part II, Technical Papers.

Philadelphia, Pa. : The American Society for Testing Materials, 260, S. Broad Street, 2 072 pages (2 vol.). (Price on application.)

1938 621 .15 (02

SALKADE (K. N.).

Points and crossings, with explanatory notes and formulae for the 5-ft. 6-in. gauge. Third edition, revised and elarged.

Bombay n° 7, India : The Popular Book Depot (Registered), Grant Road. 7 1/2 in. × 4 3/4, 374 pages. 97, illus. (Price : Rs. 4-8-0, postage Rs. 0-8-0.)

1938 625 .172

Suppression of weeds by fertilizers and chemicals. By H. C. Long, B. Sc. (Agric.); 57 pages, 8 1/2 in. × 5 1/2 in. (Price : 2 s.) — Some chemical methods of weed destruction. By H. C. Long and R. K. MacDowall, Dip. R. T. C., 24 pages. 8 1/2 in. 5 1/2 in. (Price : 6 d.).

Both obtainable from Mr. H. C. Long, « The Birkins », Orchard Road, Hook, Surbiton, Surrey.

1938 621 .13 (0 (.42) & 669 (.42)

The metallurgy of a high-speed locomotive. A survey of the materials used in the construction of the streamlined express engines of the L. M. S. R. with details of analyses and tests.

London : « The Railway Gazette » Offices. (Price : 2 s. 6 d.)

In Spanish.

1937 656. (.82)

BELTRAME (J.).

La coordinación de los transportes nacionales. Ley n° 12346. Comentario y antecedentes parlamentarios.

Buenos Aires, Congreso Sudamericano de Ferrocarriles. 1 volumen, 400 páginas.

[1] The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress ntly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to ay Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, 09).

[016.385.(05]

II. — PERIODICALS.

In French.

Bulletin de la Société des ingénieurs civils de France. (Paris.)

1937 **621 .43**

Bull. de la Soc. des ing. civ. de France, sept.-oct., p. 654.

VASSEUR. — L'évolution de la technique de **construction des automotrices.** (2 400 mots & fig.)

1938 **669 .1**

Bull. de la Soc. des ing. civ. de France, fasc. n° 6, p. 140.

LE THOMAS (A.). — Les **fontes** dans la construction des machines. (900 mots.)

1938 **669 .1**

Bull. de la Soc. des ing. civ. de France, fasc. n° 6, p. 142.

BALLEY. — Les **fontes spéciales** et leurs applications. (4 000 mots.)

Bulletin de l'Association française des amis des Chemins de fer. (Paris.)

1938 **656 .225 (.44)**

Bull. de l'Assoc. française des amis des ch. de fer, mars, p. 45.

VERDIN. — Le **trafic des charbons** sur le Réseau du Nord. (12 000 mots & fig.)

Bulletin de l'Union Internationale des chemins de fer. (Paris.)

1938 **385 .4 (.44)**

Bull. de l'Union intern. des ch. de fer, janvier, p. 21.

L'organisation de la **Société Nationale des chemins de fer en France.** (2 700 mots.)

1938 **385 .4 (.492)**

Bull. de l'Union intern. des ch. de fer, janvier, p. 26.

Le **nouveau régime des chemins de fer** en Hollande. (1 000 mots.)

1938 **656 .1 (.3)**

Bull. de l'Union intern. des ch. de fer, février, p. 48.

La **circulation des automobiles** dans le monde en 1936. (2 300 mots & 4 tableaux.)

1938 **621 .33 (.3)**

Bull. de l'Union intern. des ch. de fer, février, p. 52.

L'**électrification** des chemins de fer dans les principaux pays du monde en 1937. (4 200 mots.)

Electricité. (Paris.)

1938 **621 .3 & 625**

Electricité, février, p. 49.

PELOU (M.). — L'**équipement électrique** d'ate modernes de construction de voitures de chemins de (4 600 mots & fig.)

Génie civil. (Paris.)

1938 **691 (**

Génie civil, n° 2902, 26 mars, p. 272.

Les prescriptions anglaises pour l'emploi du cin alumineux dans les **constructions en béton armé.** (2 mots & fig.)

1938 **625 .14**

Génie civil, n° 2903, 2 avril, p. 290.

BATICLE (E.). — Etude des **chocs au droit des jo de rails.** (1 500 mots & fig.)

1938 **62. (01 & 621**

Génie civil, n° 2904, 9 avril, p. 313.

DUTILLEUL (H.) & VERDIERE (G. de). — E du retrait et des tensions dans les **joints soudés.** (4 mots & fig.)

1938 **624 .51 (**

Génie civil, n° 2904, 9 avril, p. 317.

MAGNIEN (J.). — Les essais par charge d'eau **pont suspendu** d'Aiguilly, sur la Loire. (700 mots &

1938

Génie civil, n° 2905, 16 avril, p. 337.

COUILLAUD (E.). — Au sujet des essais physi des **ciments.** (600 mots.)

La construction métallique. (Bruxelles.)

1938 **621 .33 (.**

La construction métallique, 15 mars, p. 7.

DUQUESNE (E.). — L'**électrification** de la ligne xelles-Anvers. (8 000 mots & fig.)

1938 **66**

La construction métallique, 15 avril, p. 3.

Les **aciers de moulage et fontes spéciales.** (4 800 & fig.)

La Technique moderne. (Paris.)

1938

La Technique moderne, n° 7, 1er avril, p. 243.

CHEVENARD (P.). — La **métallurgie de préci** (10 000 mots & fig.)

8 62. (01
chnique moderne, n° 8, 15 avril, p. 259.
SAR (V.). — Les progrès récents et les applications photo-élasticimétrie. (5 900 mots & fig.)

8 621 .13
chnique moderne, n° 8, 15 avril, p. 275.
RCIER (A.). — Les locomotives à vapeur moder- 1 800 mots & fig.)

Le Container. (Paris.)

38 656 .225 & 656 .261
ntainer, février, p. 2.
petits containers de construction récente. (6 500 & fig.)

38 656 .225 (.493) & 656 .261 (.493)
ntainer, février, p. 23.
uvelles prescriptions pour le dédouanement de con- s en Belgique. (1 700 mots.)

38 656 .225 (.494) & 656 .261 (.494)
ntainer, février, p. 26.
uvelles prescriptions concernant le transport par iners en Suisse. (2 200 mots & fig.)

38 656 .225 (.437) & 656 .261 (.437)
ntainer, février, p. 31.
uvelles dispositions concernant le transport par iners et dispositions tarifaires sur les Chemins de Etat tchécoslovaques. (3 800 mots.)

38 656 .225 & 656 .261
ntainer, février, p. 41.
sibilités d'emploi des containers en trafic interna- combiné chemin de fer et voie d'eau. (1 300 mots.)

Chemins de fer et les Tramways. (Paris.)

8 621 .134.5 & 625 .214
hemins de fer et les Tramways, janvier, p. 6.
GUENAUER (I.). — Théorie et pratique du grais- Etude spéciale de la lubrification des véhicules de is de fer. (6 700 mots & fig.)

8 621 .132.8 (.73)
iemins de fer et les Tramways, janvier, p. 12.
motive à seize cylindres établie par le Baltimore o-Railroad pour la remorque des grands trains de voyageurs à la vitesse de 160 km./h. (800 mots

8 621 .43 (.44)
iemins de fer et les Tramways, janvier, p. 13.
LEYAN (L.). — L'automotrice Decauville 6 000 du P. L. M. (1 800 mots.)

8 656 .254
iemins de fer et les Tramways, janvier, p. 16.
ème d'enregistrement et de répétition des signaux voie sur les locomotives ou automotrices. (8 600 & fig.)

1938 621 .134.1
Les Chemins de fer et les Tramways, janvier, p. 22.
Procédé de forgeage des essieux coudés de locomotives. (3 200 mots.)

1938 621 .89
Les Chemins de fer et les Tramways, février, p. 30.
HAGUENAUER (I.). — Les appareils d'essai pour la mesure des coefficients de friction des lubrifiants et alliages de frottement. (7 200 mots & fig.)

1938 621 .33
Les Chemins de fer et les Tramways, février, p. 40.
L'électrification des chemins de fer. Considérations techniques et économiques. (1 200 mots.)

1938 621 .43
Les Chemins de fer et les Tramways, février, p. 42.
Autorail Rochet-Schneider à trois essieux. (1 400 mots.)

1938 621 .132.8 (.44)
Les Chemins de fer et les Tramways, février, p. 43.
Automotrices à vapeur Sentinel de la Région Ouest. (300 mots.)

1938 625 .143.5
Les Chemins de fer et les Tramways, février, p. 44.
Procédé et outil pour la formation de chambres dans les nervures transversales de selles ou plaques d'assise de rails. (2 400 mots & fig.)

L'Industrie des voies ferrées et des transports automobiles. (Paris.)

1938 656 (.43)
L'Ind. des voies ferrées et des transp. autom., février, p. 30.
VENTE. — La corporation des transports en régime national-socialiste en Allemagne. (2 200 mots.)

L'Ingénieur-Constructeur. (Paris.)

1938 624 .2
L'Ingénieur-constructeur, janvier-février-mars, p. 4227.
GARNIER (R.). — Essais sur les formules relatives aux poutres droites hyperstatiques. (3 800 mots & fig.)

1938 62. (01 & 691
L'Ingénieur-constructeur, janvier-février-mars, p. 4242.
SARTON (A.). — Sur l'étude graphique de la flexion composée en béton armé. (1 200 mots & fig.)

L'Ossature métallique. (Bruxelles.)

1938 656 .211.5 (.45) & 725 .31 (.45)
L'Ossature métallique, avril, p. 173.
FAVA (Al.). — La couverture métallique des nouveaux édifices de la gare de Florence. (2 700 mots & fig.)

1938 **624**
L'Ossature métallique, avril, p. 181.
SCHAPER (G.). — La construction et la forme des appuis pendulaires des **ponts en acier**. (1 800 mots & fig.)

Revue générale des chemins de fer. (Paris.)

1938 **621** .131.3 (.44) & **621** .132.3 (.44)
Revue générale des chemins de fer, avril, p. 193.
PARMANTIER (A.). — **Locomotives Pacific** P. L. M. 231-G, 231-H, 231-K. (6 700 mots & fig.)

1938 625 .173 (.44)
Revue générale des chemins de fer, avril, p. 215.
NERVILLE (F. G. de). — Exécution de certains **travaux de voie** avec ralentissement des trains à 60 ou 80 km./h. (3 000 mots & fig.)

1938 **656** .235 (.44)
Revue générale des chemins de fer, avril, p. 225.
ESCOLLE. — La **tarification des marchandises** des chemins de fer français. (7 600 mots & fig.)

1938 **656** (.44)
Revue générale des chemins de fer, avril, p. 241.
Les premières applications de la **coordination** dans la région de l'Ouest. Mayenne-Calvados-Orne-Sarthe. (3 600 mots, tableaux & fig.)

1938 **625** .17 (.44)
Revue générale des chemins de fer, avril, p. 252.
BARMANN. — **Utilisation de véhicules rail-route** par le Service de la Voie et des Bâtiments de la Région du Nord. (600 mots & fig.)

1938 **625** .232 (.44)
Revue générale des chemins de fer, avril, p. 255.
Voitures infirmerie pour trains de pèlerinage. (600 mots & fig.)

Société Royale Belge des Ingénieurs et des Industriels. (Bruxelles.)

1938 **665** .882
Soc. Royale des Ing. et des Ind., n° 2, p. 143.
HENRION (E.). — Derniers progrès de la **soudure autogène**. (10 500 mots.)

Traction nouvelle. (Paris.)

1938 **621** .43 (.44)
Traction nouvelle, mars-avril, p. 38.
DEGAND (G.). — Le développement des **services d'autorails** en France. (3 800 mots & fig.)

1938 **621** .43 & **625** .251
Traction nouvelle, mars-avril, p. 48.
NICOLET (V.) & ROUSSELET (R.). — Le **frein autoréglé N. R.** (1 500 mots & fig.)

1938 **621** .43 (.4
Traction nouvelle, mars-avril, p. 52.
ZANESCO (A.). — Les **autorails** des chemins de roumains. (2 500 mots & fig.)

1938 **625** .
Traction nouvelle, mars-avril, p. 64.
CHATEL. — Les **ruptures d'essieux d'autor** (1 800 mots & fig.)

In German.

Archiv für Eisenbahnwesen. (Berlin.)

1938 **385** .1 (.4
Archiv für Eisenbahnwesen, Januar-Februar, S. 1.
RUFENACHT (E.). — Der **Erneuerungsfonds** bei Schweizerischen Eisenbahnen. (16 400 Wörter.)

1938 **385** .113 (.49
Archiv für Eisenbahnwesen, Januar-Februar, S. 87.
REMY. — Die **südslawischen Eisenbahnen** 1934 1935. (6 500 Wörter & Abb.)

1938 **385.** (09 (
Archiv für Eisenbahnwesen, Januar-Februar, S. 111
RADEMAKER (E. G.). — Die **Baltimore & Ohio senbahn.** (9 500 Wörter.)

1938 **656** .234 (.4
Archiv für Eisenbahnwesen, Januar-Februar, S. 141
SERAPHIM (P. H.). — Die **Personentarifpolitik** polnischen Staatsbahnen. (3 600 Wörter.)

1938 **388** (
Archiv für Eisenbahnwesen, Januar-Februar, S. 151
WERNEKKE. — **Pariser Verkehr.** (3 000 Wörter

1938 **385** .113 (
Archiv für Eisenbahnwesen, Januar-February, S. 15
Die **Italienischen Staatsbahnen** in den Geschäftsja 1933-34, 1934-35 und 1935-36. (3 400 Wörter.)

Die Lokomotive. (Wien.)

1938 **621** .132.5 (.51) & **625** .616 (
Die Lokomotive, März, S. 37.
Meterspurige 1 E-Lokomotive der Tungpu-Bah China. (700 Wörter & Abb.)

1938 **621** .33 (.
Die Lokomotive, März, S. 39.
Der gegenwärtige Stand der **Elektrisierungsarb** der Österr. Bundesbahnen. (900 Wörter.)

1938 **621** .132.5 (.
Die Lokomotive, März, S. 41.
1 **D-Heissdampf-Zwillings-Güterzuglokomotive** 403 der kgl. ung. Staatseisenbahnen. (1 100 Wört Abb.)

Die Reichsbahn. (Berlin.)

938 **385** (.436)
Reichsbahn, Heft 12, 23. März, S. 273.
ITTEL (Th.). — Zum **Übergang** der Österreichi-
en Bundesbahnen auf das Reich. (1 800 Wörter.)

---

938 **385** .517.6 (.43)
Reichsbahn, Heft 12, 23. März, S. 278.
IARTENS (H. A.). — Grundlagen und Probleme
persönlichen Unfallverhütung bei der Deutschen
chsbahn .(11 700 Wörter & Abb.)

---

938 **624** .32 (.43)
Reichsbahn, Heft 13, 30. März, S. 314.
CHAPER (G.). — Die beiden neuen **Rheinbrücken**
Maxau und Speyer. (1 200 Wörter & Abb.)

---

938 **385** .517 (.43)
Reichsbahn, Heft 14, 6. April, S. 343.
LEINMANN. — Die **sozialen Leistungen** der Deut-
en Reichsbahn seit 1933. (4 200 Wörter.)

---

938 **385** .1 (.43)
Reichsbahn, Heft 14, 6. April, S. 348.
RANG. — Gegenwartsfragen der **Finanzpolitik** der
tschen Reichsbahn. (9 400 Wörter.)

Elektrische Bahnen. (Berlin.)

938 **621** .335 (.485)
ktrische Bahnen. Februar, S. 27.
YBLIN (S.). — **Ausbesserung elektrischer Loko-**
tiven in den schwedischen Staatseisenbahnwerkstät-
in Malmö. (2 700 Wörter & Abb.)

---

938 **621** .33 (.485)
ktrische Bahnen, Februar, S. 32.
ÖRNER (J.). — Neuere **Privatbahn-Elektrisierun-**
in Schweden. (2 400 Wörter & Abb.)

---

938 **621** .33 (.481)
ktrische Bahnen, Februar, S. 36.
ENZEL (E.). — Der **Netzkupplungs-Umformer**
lgfoss als Bestandteil der Stromversorgungsanlagen
Norwegischen Staatsbahnen. (5 700 Wörter & Abb.)

---

938 **621** .333
ktrische Bahnen, Februar, S. 46.
TIER (F.). — Über die Aufhebung der Transforma-
pannung beim **Einphasenbahnmotor.** (1 800 Wörter
bb.)

Glasers Annalen. (Berlin.)

938 **621** .8
sers Annalen, Heft 5, 1. März, S. 49.
CHMELZER. — Einige Neuerungen aus dem **Hebe-**
gbau. (1 800 Wörter & Abb.)

1938 **621** .43 (.43)
Glasers Annalen, Heft 5, 1. März, S. 52.
Ein neuer **dieselelektrischer Schnelltriebwagen** der Deutschen Reichsbahn. (800 Wörter & Abb.)

1938 **656** .225 (.73)
Glasers Annalen, Heft 6, 15. März, S. 75.
WERNEKKE. — Ein amerikanischer **Eilgüterzug.** (1 400 Wörter.)

Organ für die Fortschritte des Eisenbahnwesens. (Berlin.)

1938 **656** .212.5
Organ für die Fortschr. des Eisenbahnw., Heft 7, 1. April, S. 125.
MÜLLER (W.). — **Ablaufanlagen** ohne Talbremsen bei Zuführung der Züge durch Lokomotiv- oder Schwerkraft. (6 600 Wörter, 1 Tafel & Abb.)

1938 **625** .29 (.43) & **625** .234 (.43)
Organ für die Fortschr. des Eisenbahnw., Heft 7, 1. April, S. 134.
BAUR (H.). — Der neue **Heizungsmesswagen** der Deutschen Reichsbahn. (3 300 Wörter & Abb.)

1938 **625** .253
Organ für die Fortschr. des Eisenbahnw., Heft 8, 15. April, S. 145.
HILDEBRAND (F.) & MÖLLER (E.). — Ein selbsttätiges Führerbremsventil für **Druckluftbremsen.** (5 000 Wörter & Abb.)

1938 **625** .212
Organ für die Fortschr. des Eisenbahnw., Heft 8, 15. April, S. 152.
AHRENS (R.). — Die **Innenlagerung der Radsätze.** (2 400 Wörter & Abb.)

1938 **621** .132.8
Organ für die Fortschr. des Eisenbahnw., Heft 8, 15. April, S. 155.
Neuere **Stromlinien-Lokomotiven.** (2 200 Wörter & Abb.)

1938 **621** .132.5 (.73) & **621** .132.8 (.73)
Organ für die Fortschr. des Eisenbahnw., Heft 8, 15. April, S. 158.
Neuere amerikanische **Mallet-Gelenklokomotiven.** (3 400 Wörter & Abb.)

Zeitschrift für das gesamte Eisenbahn-Sicherungs- und Fernmeldewesen. (Berlin.)

1938 **656** .256
Zeitschr. für das ges. Eisenbahn-Sicherungswesen- und Fernmeldewesen, Nr. 5, 10. April, S. 57.
BUDDENBERG (A.). — **Schienenstromschliesser.** (2 300 Wörter, 1 Tafel & Abb.)

1938 **656 .256**
Zeitschr. für das ges. Eisenbahn-Sicherungswesen- und Fernmeldewesen, Nr. 5, 10. April, S. 61.

NITSCHKE. — Die **Streckenblockung auf eingleisigen Bahnen.** (2 600 Wörter & Abb.)

Zeitschrift des Vereines Deutscher Ingenieure (Berlin.)

1938 **62. (01 & 669**
Zeitschr. des Ver. deutsch. Ing., Nr. 13, 26. März, S. 370.

PIWOWARSKY (E.). — Einfluss von Korrosion auf die **Festigkeitseigenschaften von Gusseisen.** (2 500 Wörter & Abb.)

1938 **621 .132.3 (.73)**
Zeitschr. des Ver. deutsch. Ing., Nr. 13, 26. März, S. 384.

Amerikanische **Stromlinienlokomotive.** (700 Wörter & Abb.)

1938 **62. (01 & 669**
Zeitschr. des Ver. deutsch. Ing., Nr. 14, 2. April, S. 397.

MOUSSON (J. M.). — Untersuchungen über **Hohlsog** (Kavitation). (1 900 Wörter & Abb.)

1938 **62. (01 & 669 .1**
Zeitschr. des Ver. deutsch. Ing., Nr. 14, 2. April, S. 417.

PUMP (A.). — **Festigkeit nickelhaltiger und nickelfreier Stähle,** insbesondere bei Schwingungsbeanspruchung. (1 100 Wörter & Abb.)

1938 **621 .43 (.436)**
.eitschr. des Ver. deutsch. Ing., Nr. 15, 9. April, S. 440.

PREITNER (H.). — **Dieselhydraulischer Triebwagen** der ehemaligen Österreichischen Bundesbahnen. (2 000 Wörter & Abb.)

1938 **62. (01**
Zeitschr. des Ver. deutsch. Ing., Nr. 16, 16. April, S. 457.

FREISE (H.). — Ritzgeräte zum Aufzeichnen schnellwechselnder **Spannungen, Drücke und Kräfte.** (2 600 Wörter & Abb.)

1938 **624 .51 (.436)**
Zeitschr. des Ver. deutsch. Ing., Nr. 16, 16. April, S. 475.

Die neue **Reichsbrücke** in Wien. (1 100 Wörter & Abb.)

Zeitung des Vereins mitteleuropäischer Eisenbahnverwaltungen. (Berlin.)

1938 **656 (.43)**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 12, 24. März, S. 233.

GALLÉRA (von). — Die Privat- und Kleinbahnen und der « **gewerbliche Güterfernverkehr** ». (8 000 Wörter.)

1938 **656 .231 (.494)**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 13, 31 März. S. 253.

DIRLEWANGER. — Neuausgabe der Allgemeinen **Tarifvorschriften** und der **Güterklassifikation** in der Schweiz. (3 600 Wörter.)

1938 **385. (072 (.43**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 1
31. März, S. 257.

KÜHNEL (R.) & PUSCH (A.). — Die **mechanisch Versuchsanstalt** des Reichsbahn-Zentralamts Berli (1 700 Wörter & Abb.)

1938 **385 .**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 1
7. April, S. 277.

SCHMID (E.). — Die Schwierigkeiten der Revisio und der Ratifikation der **internationalen Eisenbahnübe einkommen.** (1 200 Wörter.)

1938 **656 .23**
Zeitung des Ver. mitteleurop. Eisenbahnverw., Nr. 1
14. April, S. 292.

NIESSEN. — Zur **Auslegung der Eisenbahn-Güte tarife.** (3 700 Wörter.)

In English.

Electrical Industries. (London.)

1938 **621 .**
Electrical Industries, No. 4, April, p. 147.

HARRIS (J. B.). — **Modern lighting schemes.** (1 8 words & fig.)

Engineer. (London.)

1938 **621 .33 (.4**
Engineer, No. 4288, March 18, p. 311 and No. 428 March 25, p. 328.

The electrification of the L. M. S. Wirral lines. (5 5 words & fig.)

1938 **621 .43 (.8**
Engineer, No. 4289, March 25, p. 332.

102 H. P. oil engined railcars for South Americ (4 100 words & fig.)

1938 **624 .32 (.8**
Engineer, No. 4290, April 1, p. 354.

RISDON (P. J.). — **Verrugas bridge, Peru.** (4 0 words & fig.)

1938 **621 .**
Engineer, No. 4290, April 1, p. 360 and No. 4291, April p. 384.

FIEGEHEN (E. G.). — **Travelling carriages for p table cranes.** (8 800 words & fig.)

1938 **621 .43 (.4**
Engineer, No. 4290, April 1, p. 370 and No. 4291, April p. 390.

L. M. S. oil-engined train. (6 500 words & fig.)

1938 **621 .**
Engineer, No. 4290, April 1, p. 374.

Progress in power rectifiers. (1 800 words.)

8 625 .245 (.42)
er, No. 4291, April 8, p. 398.
w road-rail vehicle. (1 800 words & fig.)

8 621 .392
er, No. 4291, April 8, p. 399.
ling of steel structures. (1 800 words.)

8 62. (01 & 621 .392
er, No. 4291, April 8, p. 400.
BB (C. E.) and FORD (L. H.). — Non-destructive of welds. (3 600 words.)

8 621 .33
er, No. 4291, April 8, p. 401.
strial frequency single-phase railways. (1 000

8 669 .1
er, No. 4291, April 8, p. 403.
GDEN (E.). — Contraction and distortion in ast iron. (4 600 words & fig.)

8 621 .9
er, No. 4292, April 15, p. 423 and 431.
ide tools. (7 500 words.)

Engineering. (London.)

8 656 .213 (.42) & 656 .211.7 (.42)
eering, No. 3766, March 18, p. 289.
handling of motor-car traffic at Dover. (1 300 & fig.)

8 62. (064 (.43)
eering, No. 3766, March 18, p. 291.
Leipzig fair. (6 500 words & fig.)

8 621 .33 (.42)
eering, No. 3766, March 18, p. 295.
electrification of the Wirral Railway, Cheshire. words & fig.)

8 62. (01 & 693
eering, No. 3766, March 18, p. 307.
ts of vibrated concrete. (900 words.)

8 62. (01
eering, No. 3766, March 18, p. 309 and No. 3767, larch 25, p. 326.
on autographic testing machine. (2 200 words &

8 621 .82
eering, No. 3766, March 18, p. 311.
manufacture and inspection of ball and roller gs. (600 words.)

8 669
eering, No. 3766, March 18, p. 312.
fired continuous reheating furnace. (1 000 words .)

1938 621 .4
Engineering, No. 3767, March 25, p. 319.
LANCHESTER (F. W.). — The energy balance sheet of the gas engine. (2 300 words & fig.)

1938 621 .43
Engineering, No. 3767, March 25, p. 342.
DAVIES (S. J.). — Recent developments in high-speed oil engines. (2 900 words & fig.)

1938 621 .43 (.42)
Engineering, No. 3768, April 1, p. 349.
Three-car diesel train; London Midland and Scottish Railway. (3 300 words & fig.)

1938 62. (01 & 621 .39
Engineering, No. 3768, April 1, p. 352.
Spark tester for cable insulation. (1 200 words & fig.)

1938 355
Engineering, No. 3768, April 1, p. 359.
Air-raid precautions and transport. (2 300 words.)

1938 621 .43
Engineering, No. 3768, April 1, p. 367.
FARMER (H. O.). — Exhaust systems of two-stroke engines. (4 700 words & fig.)

1938 621 .9
Engineering, No. 3768, April 1, p. 370.
Portable power-driven appliances. (700 words & fig.)

1938 669 .1
Engineering, No. 3768, April 1, p. 372.
HATFIELD (Dr. W. H.). — Heat-resisting steels. (4 000 words & fig.)

1938 625 .13 (.73)
Engineering, No. 3769, April 8, p. 375.
The Lincoln vehicular tunnel, New York. (4 200 words & fig.)

1938 621 .43 (.41)
Engineering, No. 3769, April 8, p. 385.
Diesel rail-cars for the Great Northern Railway of Ireland. (1 100 words & fig.)

1938 621 .134.4
Engineering, No. 3769, April 8, p. 389.
The Compound locomotive. (1 900 words.)

1938 625 .245 (.42)
Engineering, No. 3769, April 8, p. 395.
The bulk transport of edible oils. (2 000 words.)

1938 621 .43
Engineering, No. 3770, April 15, p. 407.
LANCHESTER (F. W.). — The energy balance sheet of the gas engine. (5 300 words & fig.)

1938 621 .392
Engineering, No. 3770, April 15, p. 419.
Welding of steel structures. (2 600 words.)

1938 **621 .9**
Engineering, No. 3770, April 15, p. 424.
Carbide tools. (5 000 words.)

1938 **621 .392 (.54) & 624 (.54)**
Engineering, No. 3770, April 15, p. 434.
All-welded foot overbridge at Bombay. (400 words & fig.)

Engineering News-Record. (New York.)

1938 **625 .232 (.73)**
Engineering News-Record, No. 11, March 17, p. 389.
Spring-mounted skin-stressed railway car. (300 words & fig.)

1938 **624.** (0
Engineering News-Record, No. 11, p. 395 and No. 12, March 24, p. 442.
BOWDEN (E. W.). — **Roadways on bridges.** (7 800 words & fig.)

1938 **62.** (01 & **693**
Engineering News-Record, No. 11, March 17, p. 400.
STANTON (Th. E.). — **Testing cement mortars in sea water.** (1 600 words, tables & fig.)

1938 **62.** (01
Engineering News-Record, No. 11, March 17, p. 404.
BEGGS (G. E.) and TIMBY (E. K.). — **Strain rosette technique.** (1 800 words & fig.)

1938 **691 & 721 .2**
Engineering News-Record, No. 12, March 24, p. 429.
Prefabrication speeds wall erection. (1 500 words & fig.)

1938 **55 & 721 .1**
Engineering News-Record, No. 12, March 24, p. 431.
Why Marshall dam failed. (2 300 words & fig.)

1938 **55 & 721 .1**
Engineering News-Record, No. 12, March 24, p. 436.
JOHNSTON (H. R.). — **Underwater exploration** with Calyx drills. (2 400 words & fig.)

1938 **624**
Engineering News-Record, No. 13, March 31, p. 475.
Steel girder suspender link. (200 words & fig.)

1938 **621 .135 (01, 625 .14 (01 & 625 .22**
Engineering News-Record, No. 13, March 31, p. 478.
Railroad engineers plan research. (3 000 words.)

London & North Eastern Railway Magazine. (London.)

1938 **621 .132.8 (.42)**
London & North Eastern Railway Magazine, No. 4, April, p. 198.
STEDMAN (C. M.). — **Sentinel Cammell steam rail cars.** (600 words & fig.)

Modern Transport. (London.)

1938 **621 .33 (.**
Modern Transport, No. 992, March 19, p. 3.
Railway electrification in Cheshire. (5 400 words fig.)

1938 **621 .43 (.**
Modern Transport, No. 992, March 19, p. 8.
Diesel railcars for Argentina. (2 600 words & fig

1938 **621 .33 (.**
Modern Transport, No. 993, March 26, p. 3.
L. N. E. R. electrification on Tyneside. (3 500 w & fig.)

1938 **385 .15 (.42) & 656 .1 (.**
Modern Transport, No. 993, March 26, p. 7; No. April 2, p. 7 and No. 995, April 9, p. 9.
Nationalisation of transport. (6 800 words.)

1938
Modern Transport, No. 994, April 2, p. 3.
HODSOLL (E. J.). — **Defence of transport in** attack. (1 800 words.)

1938 **621 .43 (.**
Modern Transport, No. 994, April 2, p. 4.
DUMAS. — **Railcar services in France.** (1 900 wor

1938 **621 .43 (.**
Modern Transport, No. 994, April 2, p. 5.
Articulated railcars for Northern Ireland. (2 100 w & fig.)

1938 **385.** (072 (.
Modern Transport, No. 994, April 2, p. 9.
PIKE (J. R.). — **Commercial research in the Rail** industry. (1 700 words.)

1938 **625 .245 (.**
Modern Transport, No. 995, April 9, p. 3.
Conveyance of edible oils. Road-rail trailer deve ment. (1 700 words & fig.)

1938 **621 .43 (.**
Modern Transport, No. 995, April 9, p. 5.
Three car diesel unit for L. M. S. R. (2 500 word fig.)

1938 **656 (.**
Modern Transport, No. 995, April 9, p. 11.
Transport in Greater Germany. (1 600 words &

1938 **625 .4 (.42) & 656 .222 (.**
Modern Transport, No. 995, April 9, p. 15.
EVANS (E.). — **Operation on the London Un** ground. (2 200 words & fig.)

Proceedings, American Society of Civil Engineers. (New York.)

938 **624 .2 & 721**
eedings, American Society of Civil Engineers, No. 3, March, p. 431.
itural periods of uniform cantilever beams. (9 600 ds & fig.)

938 **62. (01 & 721 .9**
eedings, American Society of Civil Engineers, No. 3, March, p. 461.
n-connected plate links. (6 400 words & fig.)

938 **62. (01 & 721 .9**
eedings, American Society of Civil Engineers, No. 3, March, p. 527.
oments in flat slabs of various types. (3 000 words g.)

938 **385 .2**
eedings, American Society of Civil Engineers, No. 3, March, p. 566.
ater transportation versus rail transportation. 00 words.)

Railway Age. (New York.)

938 **624 .2 (.73) & 625 .111 (.73)**
way Age, No. 11, March 12, p. 442.
oteworthy grade separation completed at Chicago. 00 words & fig.)

938 **621 .132.3 (.73)**
way Age, No. 11, March 12, p. 450.
nta Fe installs high-speed passenger locomotives. 00 words & fig.)

938 **621 .131.2 & 621 .133**
way Age, No. 12, March 19, p. 488.
ARTINGTON (J.). — **Modern locomotive design smoke prevention.** (3 000 words.)

938 **625 .246 (.73)**
way Age, No. 12, March 19, p. 490.
pex safety-steel running board. (800 words & fig.)

938 **651 (.73)**
way Age, No. 12, March 19, p. 491.
notographing waybills. (700 words.)

938 **625 .258 (.73) & 656 .212.5 (.73)**
way Age, No. 12, March 19, p. 502.
ckawanna improves yard operation. (3 500 words g.)

938 **625 .1 (06 (.73)**
way Age, No. 12, March 19, p. 506.
ngineering and maintenance officers meet at Chi- . (24 000 words.)

1938 **621 .132.3 (.73) & 621 .43 (.73)**
Railway Age, No. 13, March 26, p. 554.
Santa Fe places new streamline trains in service. (5 000 words & fig.)

1938 **625 .142 (.73)**
Railway Age, No. 13, March 26, p. 566.
How Santa Fe met challenge of unusual flood. (2 400 words & fig.)

1938 **656 .1 (.71)**
Railway Age, No. 13, March 26, p. 573.
Canadian Pacific buys big fleet. (1 900 words & fig.)

1938 **621 .132.3 (.73)**
Railway Age, No. 14, April 2, p. 597.
New New York Central locomotives show high power concentration. (4 200 words & fig.)

Railway Engineering and Maintenance. (Chicago.)

1938 **625 .143 (.73) & 665 .882 (.73)**
Railway Engineering and Maintenance, April, p. 247.
Uses torches for cutting rails at new reconditioning plant. (4 000 words & fig.)

1938 **625 .144.2 (.73)**
Railway Engineering and Maintenance, April, p. 250.
KISSAM (Ph.). — **Track alinement for fast schedules** How to maintain it. (2 200 words & fig.)

1938 **625 .144.1**
Railway Engineering and Maintenance, April, p. 255.
Rail — What is its most economical length ? (1 300 words.)

1938 **625 .143.5 (.73) & 656 .281 (.73)**
Railway Engineering and Maintenance, April, p. 257.
Failed rail fastenings cause derailment on concrete roadbed. (700 words & fig.)

1938 **625 .144.2 (.42)**
Railway Engineering and Maintenance, April, p. 259.
Superelevation for turnouts. (1 500 words & fig.)

Railway Gazette. (London.)

1938 **659**
Railway Gazette, No. 11, March 18, p. 520.
Planned publicity. (2 100 words.)

1938 **385. (091 (.94) & 656 (.94)**
Railway Gazette, No. 11, p. 522 and No. 12, March 25, p. 589.
ARTHURTON (A. W.). — **Further impressions of overseas transport.** (2 000 words.)

1938 **656 .211 (.42)**
Railway Gazette, No. 11, March 18, p. 523.
Modernised stations on the Wirral line, L. M. S. R. (1 500 words & fig.)

1938 **621 .133.8 (.42)**
Railway Gazette, No. 11, March 18, p. 528.
Speedometers for G. W. R. locomotives. (500 words & fig.)

1938 **656 .262 (.42)**
Railway Gazette, No. 11, March 18, p. 530.
Modernisation at Midland hotel, Manchester, L.M.S.R. (2 000 words & fig.)

1938 **385. (093 (.436)**
Railway Gazette, No. 12, March 25, p. 587.
Early development of the Austrian Südbahn. (2 000 words & 1 map.)

1938 **656 .22 (.68)**
Railway Gazette, No. 12, March 25, p. 590.
Overturning tests in South Africa. (1 600 words & fig.)

1938 **625 .13 (.54) & 625 .144.4 (.54)**
Railway Gazette, No. 12, March 25, p. 592.
Motorcar jack for lifting track on bridges. (600 words & fig.)

1938 **385 (.071.3 (.42) & 656 .25 (.42)**
Railway Gazette, No. 12, March 25, p. 593.
Training in signal and telegraph operation and maintenance. (1 000 words & fig.)

1938 **621 .132.3 (.42)**
Railway Gazette, No. 12, March 25, p. 597.
Rebuilt 4-6-0 type locomotive, L. N. E. R. (300 words & fig.)

1938 **625 .214 (.62)**
Railway Gazette, No. 12, March 25, p. 598.
BINGHAM (A. C.). — **Manganese steel liners for axleboxes.** (400 words & fig.)

1938 **625 .3 (.42)**
Railway Gazette, No. 12, March 25, p. 599.
Incline working on the L. M. S. R. (1 200 words & fig.)

1938 **621 .43 (.42)**
Railway Gazette, No. 12, March 25, p. 601.
A new English diesel train. (600 words & fig.)

1938 **656 .25 (.92)**
Railway Gazette, No. 13, April 1, p. 661.
Signalling in Netherland India. (900 words & fig.)

1938 **625 .232 (093 & 656 .224 (093**
Railway Gazette, No. 13, April 1, p. 662.
Centenary of the travelling Post Office. (4 800 words & fig.)

1938 **621 .132 (.931)**
Railway Gazette, No. 13, April 1, p. 668.
New Pacific locomotives in New Zealand. (600 words & fig.)

1938 **656 .235.5 (.42)**
Railway Gazette, No. 14, April 8, p. 701.
Agreed charges. (800 words.)

1938 **656. (.44)**
Railway Gazette, No. 14, April 8, p. 709.
Road and rail co-ordination in France. (1 500 words.

1938 **625 .245 (.42)**
Railway Gazette, No. 14, April 8, p. 711.
Road-rail bulk conveyance of edible oils. (2 800 words & fig.)

1938 **656 .1 (.73)**
Railway Gazette, No. 14, April 8, p. 715.
The Greyhound System in the U. S. A. (2 200 words & fig.)

1938 **656 .225 (.494 + .73**
Railway Gazette, No. 14, April 8, p. 718.
Two methods of **motorcar transport by rail.** (10 words & fig.)

1938 **621 .138.1 (.54**
Railway Gazette, No. 14, April 8, p. 719.
Equipment at a modern locomotive running depo in India. (1 500 words & fig.)

1938 **621 .392 & 624. (**
Railway Gazette, No. 14, April 8, p. 722.
Railway bridge girders welded of old rails. (500 word & fig.)

1938 **385. (072 (.42) & 698 (.42**
Railway Gazette, No. 14, April 8, p. 727.
Paint research on the L. M. S. R. (800 words.)

1938 **621 .13 (**
Railway Gazette, No. 15, April 15, p. 749.
DIAMOND (E. L.). — **Chapelon on the steam loco motive.** — A review of M. André Chapelon's importan new book in which notable developments of the Ste phenson locomotive are forecast, based on the perfec ing of detail design. (2 300 words & fig.)

1938 **625 .14 (01 & 625 .144.1 (.4**
Railway Gazette, No. 15, April 15, p. 754.
Buckling in welded track. (600 words.)

1938 **621 .39 (.43) & 656 .25 (.4**
Railway Gazette, No. 15, April 15, p. 755.
Automatic voltage control for light signals. (6 words & fig.)

1938 **624 .8 (.5**
Railway Gazette, No. 15, April 15, p. 756.
The Chien Tang bridge, China. (1 400 words & fig.)

1938 **621 .131.3 (.44) & 621 .132.3 (.4**
Railway Gazette, No. 15, April 15, p. 759.
Trials of Alsace-Lorraine two-cylinder Pacifics. (1 3 words & fig.)

1938 621 .94 (.42)
lway Gazette, No. 15, April 15, p. 761.
new locomotive wheel and journal turning lathe. 0 words & fig.)

1938 621 .13 (0 (.73)
ilway Gazette, No. 15, April 15, p. 764.
Streamline enterprise on the Santa Fé. (900 words & .)

1938 621 .43 (.82)
esel Railway Traction, p. 562, supplt. to the Railway Gazette, March 18.
A hundred railcars for South America. (4 800 words fig.)

1938 621 .43 (.41)
esel Railway Traction, p. 573, supplt. to the Railway Gazette, March 18.
More articulated trains for Ireland. (2 000 words & .)

1938 621 .43 (.42)
esel Railway Traction, p. 770, supplt. to the Railway Gazette, April 15.
Triple-car diesel train for the L. M. S. R. (5 700 words fig.)

1938 621 .43 (.44)
esel Railway Traction, p. 780, supplt. to the Railway Gazette, April 15.
DUMAS (L.). — Railcar services in France. (700 rds & fig.)

1938 621 .43 (.82)
esel Railway Traction, p. 781, supplt. to the Railway Gazette, April 15.
Luxury diesel trains for Argentina. (1 600 words & .)

1938 621 .33 (.42)
ectric Railway Traction, p. 686, supplt. to the Railway Gazette. April 1.
Electrification of the Wirral lines. (4 500 words & .)

1938 621 .338 (.42)
ectric Railway Traction, p. 694, supplt. to the Railway Gazette, April 1.
Modern rolling stock for Tyneside lines. (1 800 words fig.)

1938 385 .113 (.42)
Financial and operating results of the British Group ilways in 1937. (Supplement to the Railway Gazette, arch 25), 32 pp.

Railway Magazine. (London.)

1938 656 .29 (.42)
ilway Magazine, No. 490, April, p. 235.
Closed branch lines — I. (1 000 words.)

1938 656 .254
Railway Magazine. No. 490, April, p. 240.
The Kofler automatic train stop. (500 words & fig.)

1938 621 .132.1 (.73) & 656 .222.1 (.73)
Railway Magazine. No. 490, April, p. 241.
Modern American locomotive performance. — 1. Streamlined high speed steam trains. (4 000 words & fig.)

1938 656 .222.1 (.42)
Railway Magazine. No. 490, April, p. 247.
ALLEN (C. J.). — British locomotive practice and performance. (4 300 words & fig.)

1938 621 .132.3 (.42) & 621 .132.4 (.42)
Railway Magazine. No. 490, April, p. 268.
« Manor » class locomotives, G. W. R. (400 words & fig.)

1938 385. (091 (.42)
Railway Magazine. No. 490, April, p. 273.
ROBINSON (H. A.). — The Wirral Railway, old and new. (3 200 words & fig.)

South African Railways and Harbours Magazine. (Johannesburg.)

1938 621 .132.3 (.68)
South African Railways & Harbours Magazine, March, p. 301.
New engines for the South African Railways. Arrival of the class 23 locomotives. (1 500 words & fig.)

The Locomotive. (London.)

1938 656 .224 (.42)
The Locomotive, No. 548, April 15, p. 99.
Post Office mail trains. (2 100 words.)

1938 621 .132.3 (.54)
The Locomotive, No. 548, April 15, p. 101.
New 4-6-0 locomotives, Bengal Nagpur Railway. (900 words & fig.)

1938 621 .132.8 (.62)
The Locomotive, No. 548, April 15, p. 103.
Sentinel geared steam locos., Egyptian State Railways. (900 words.)

1938 621 .43 (.41)
The Locomotive, No. 548, April 15, p. 107.
Articulated railcars, Great Northern Railway, Ireland. (1 600 words & fig.)

1938 621 .33 (.42)
The Locomotive, No. 548, April 15, p. 109.
Wirral lines electrification, L. M. S. R. (4 700 words & fig.)

1938 **621 .87 (.42)**
The Locomotive, No. 548, April 15, p. 114.
36-ton travelling cranes, Southern Railway. (700 words & fig.)

1938 **621 .43 (.44)**
The Locomotive, No. 548, April 15, p. 115.
The development of rail motor car services in France. (2 600 words.)

1938 **625 .172 & 625 .245**
The Locomotive, No. 548, April 15, p. 119.
Old and new inspection cars. (1 000 words & fig.)

1938 **625 .235**
The Locomotive, No. 548, April 15, p. 126.
Steel and wood in railway coach construction. (1 800 words.)

1938 **621 .43 (.82)**
The Locomotive, No. 548, April 15, p. 128.
Oil-engined Drewry railcars. (1 300 words & fig.)

The Oil Engine. (London.)

1938 **621 .43 (.82)**
The Oil Engine, No. 60, Mid April, p. 374.
Building railcars of a standardized type. — Trials of the first of 107 Drewry railcars destined for South America. Solo or multiple operation. (1 500 words & fig.)

1938 **621 .43 (.42)**
The Oil Engine, No. 60, Mid April, p. 380.
A shunting locomotive for an oil refinery. (1 400 words & fig.)

1938 **621 .43 (.41)**
The Oil Engine, No. 60, Mid April, p. 385.
Two more articulated railcars for Eire. (600 words & fig.)

1938 **621 .43 (.42)**
The Oil Engine, No. 60, Mid April, p. 386.
First British diesel express train. (2 500 words & fig.)

1938 **621 .43 (.44)**
The Oil Engine, No. 60, Mid April, p. 396.
DUMAS. — **Diesel trains in France.** (3 200 words.)

In Spanish.

Revista del Colegio de Ingenieros de Venezuela. (Caracas-Venezuela.)

1937 **624**
Revista del Colegio de Ingenieros de Venezuela, noviembre-diciembre, p. 144.
BAYOT (J. M.). — Líneas de influencia para **puentes rígidos** de tres tramos. (600 palabras & fig.)

In Italian.

Annali dei lavori pubblici. (Roma.)

1938 **624 .61 (.45)**
Annali dei lavori pubblici, febbraio, p. 127.
DE MARTINO e GALLI. — Il **nuovo ponte ferroviario** sul Reno presso Bologna. (2 300 parole & fig.)

Rivista tecnica delle ferrovie italiane. (Roma.)

1938 **625 .1 (.45)**
Rivista tecnica delle ferrovie italiane, 15 marzo, p. 105.
GAROFOLI. — La **nuova ferrovia** Alcamo-Segesta Trapani. (9 000 parole & fig.)

1938 **385. 587 (.45) & 625 .26 (.45)**
Rivista tecnica delle ferrovie italiane, 15 marzo, p. 130.
FANELLI. — La soppressione dell'appuntatura della mano d'opera nelle **officine di riparazione del materiale** delle Ferrovie dello Stato. (2 700 parole & fig.)

1938 **624 .6 & 721 .**
Rivista tecnica delle ferrovie italiane, 15 marzo, p. 143.
POLSONI (G.). — Frecce elastiche degli **archi incastrati.** (2 900 parole.)

Trasporti e lavori pubblici. (Roma.)

1938 **621 .33 (.454 + .494)**
Trasporti e lavori pubblici, febbraio, p. 47.
MESCHIERI (A.). — Italia e svizzera nell' esercizio delle linee ferroviarie a **trazione elettrica.** (1 200 parole.)

In Dutch.

De Ingenieur. (Den Haag.)

1938 **385. (92)**
De Ingenieur, Nr 13, 1 April, p. V. 23.
VAN SCHOUWENBURG (W.). — De **Nederlandsch Indische Spoorweg Maatschappij** en de crisis van 1929 (11 000 woorden, 11 tafereelen & fig.)

Spoor- en Tramwegen. (Utrecht.)

1938 **621 .4**
Spoor- en Tramwegen, Nr 7, 29 Maart, p. 149.
Hoe ontwikkelt zich de **motortractie.** (2 500 woorden & fig.)

1938 **621 .392 (.92**
Spoor- en Tramwegen, Nr 8, 12 April, p. 173.
DE LANG (W.). — Het **weerstands- en automatisch lasschen** bij de Deli Spoorweg- Maatschappij. (2 200 woorden & fig.) (Wordt vervolgd.)

1938 385 .57

oor- en Tramwegen, Nr 8, 12 April, p. 178.

VAN HOUTEN (W.). — **Beschouwingen van het In-**rnationale Spoorwegcongres te Parijs in 1937 omtrent t **spoorweg-personeel.** (1 300 woorden.)

In Polish.

(= 91.885)

Inżynier Kolejowy. (Warszawa.)

1938 385 .113 = **91** .885

zynier Kolejowy, No. 4, p. 138.

SWIESCIAKOWSKI (T.). — **Railway operating re-lts,** according to the statistics drawn up by the U.I.C. nt. Union of Rys.). (4 200 words, 13 tables & fig.)

1938 **621** .33 (.438) = **91** .885

Inzynier Kolejowy, No. 4, p. 146.

KEPSKI (S.). — **The overhead network of the War-saw electric railway centre.** (8 400 words & fig.)

1938 **621** .335 (.438) = **91** .885

Inzynier Kolejowy, No. 4, p. 157.

PLEWAKO (S.). — **Type Bo + Bo (El. 100) electric locomotive** of the Warsaw electric railway centre. (3 800 words & fig.)

1938 **625** .17 = **91** .885

Inzynier Kolejowy, No. 4, p. 168.

PAPRZYCKI. — **Mechanical tamping of sleepers.** (2 700 words & fig.)

M. Weissenbruch Co., Ltd., Printer of the King, 49, rue du Poinçon, Bruxelles.

XX — N° 6

JUNE 1938

Monthly Bulletin of the International Railway Congress Association

(English Edition)

Westinghouse completes 40½ track miles

of Automatic Signalling on the Suburban area of the

L. & N. E. RLY.

by the inauguration of the new Power Signal installation between

This installation was brought into service on January 29/30, without delay to, or interruption of traffic.

This section completes the power signalling of what is claimed to be the busiest steam operated line in the world — between Bethnal Green and Hackney Downs to Enfield via Seven Sisters, and to Chingford via Clapton — over which runs the rush-hour traffic into and out of Liverpool Street Station.

The apparatus was supplied by, and installed by the outdoor staff of

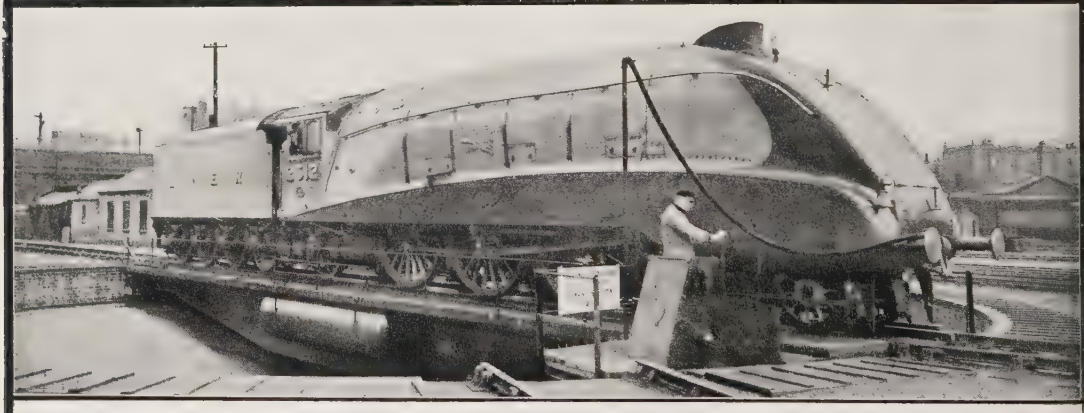
WESTINGHOUSE BRAKE & SIGNAL CO. LTD

82, YORK WAY, KING'S CROSS, LONDON, N. 1.

Works, Chippenham, Wilts, England

A NEW METHOD
of turning Locomotives (Patented)
BY POWER FROM THE BRAKE SYSTEM

L. M. S. Turbine Locomotive on one of our Non-Balanced Turntables fitted with our Patent Vacuum Engine



L. N. E. R. Locomotive being turned on an existing Balanced Turntable fitted with our Patent Vacuum Engine Tractor

BALANCED AND ARTICULATED TURNTABLES
WATER COLUMNS AND WHEEL DROPS
RAILWAY BREAKDOWN CRANES
with and without patent relieving bogies
DOCK CRANES AND CAPSTANS
of every description
OVERHEAD CRANES

COWANS, SHELDON & Co LTD

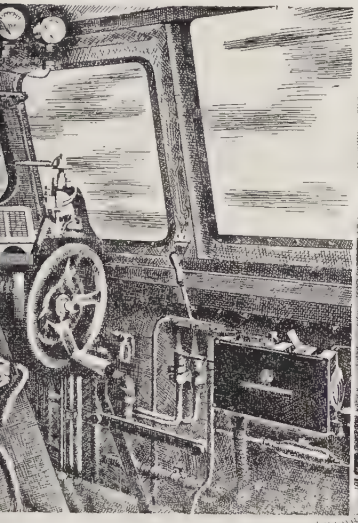
London Office :
BUSH HOUSE ALDWYCH W. C. 2
Telephone : Temple Bar 7851

ST. NICHOLAS WORKS, CARLISLE
TELEPHONE : CARLISLE 13

Automatic Train Control

train speed 200 km/h

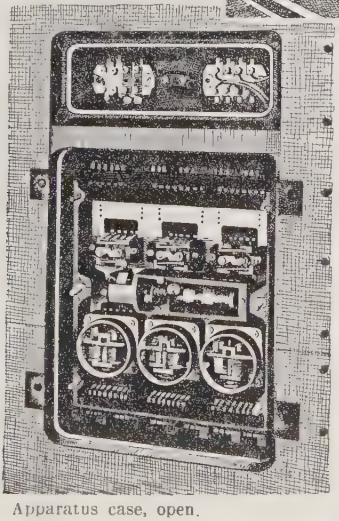
NDUCTIVE SYSTEM)



ding tachometer and brake device
e cab of a streamlined locomotive
e German State Railways.

One of the founder firms of the « Vereinigte Eisenbahn-Signalwerke » was the first German factory to design automatic train control apparatus. The VES automatic train control system is based on 30 years research work and has proved its efficiency and reliability for the highest train speeds obtained up to now. On a test run, a streamlined steam locomotive of the German State Railways, equipped with automatic train control apparatus, reached a speed of 201 km/h.

Apparatus case and locomotive magnet.



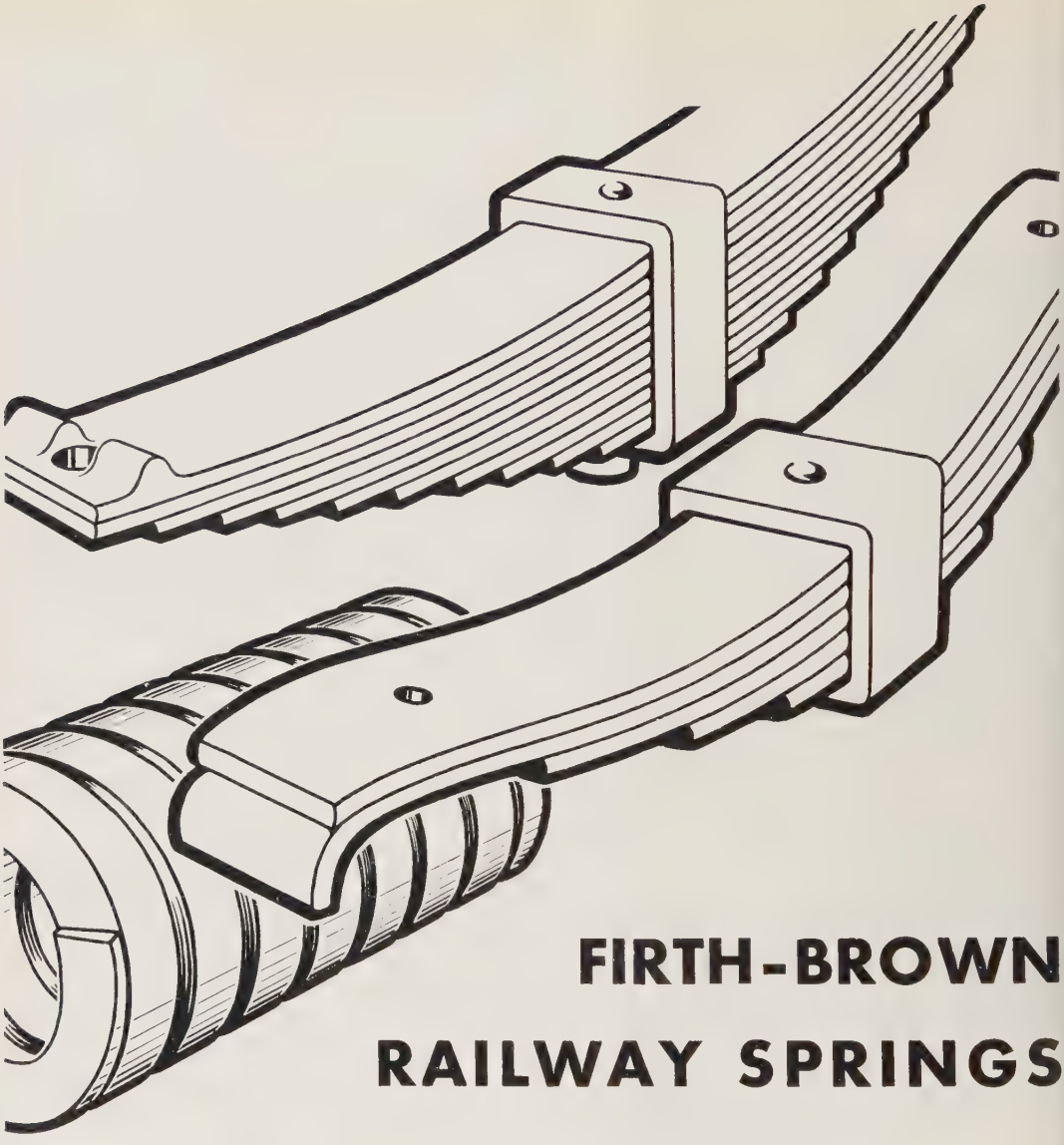
Apparatus case, open.

VFS

EREINIGTE EISENBAHN - SIGNALWERKE

M. B. H.

RLIN - SIEMENSSTADT

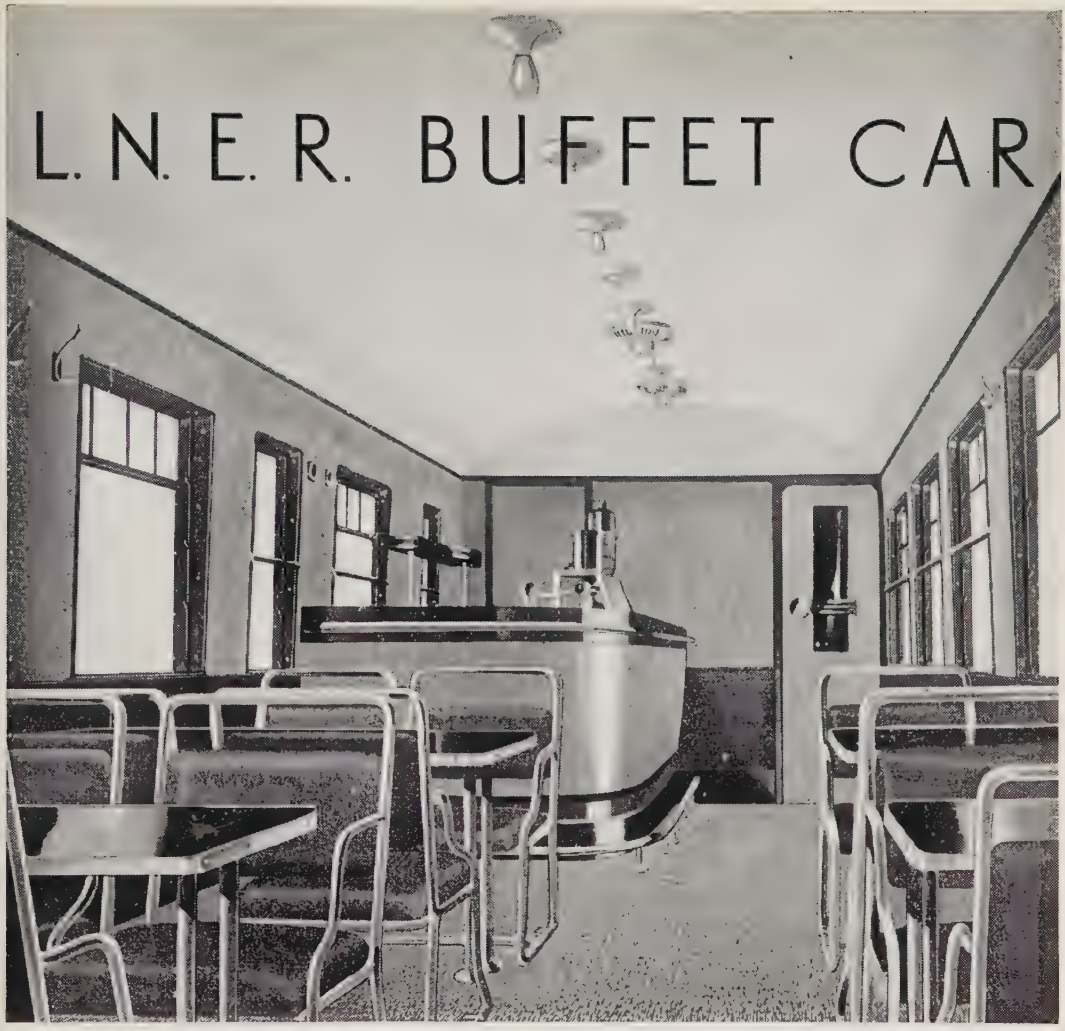


FIRTH-BROWN RAILWAY SPRINGS

BIF 1937
BIRMINGHAM
ENGINEERING AND HARDWARE SECTION
FEBRUARY 15-26
SEE OUR EXHIBIT

Specialising in the production of wagon, carriage and loco springs, this company places at the disposal of Railway authorities an unusually wide experience of spring problems, unsurpassed facilities for research and rapid, accurate production resources. This service is keyed up to one ideal – that of meriting continued confidence.

THOS. FIRTH & JOHN BROWN LTD. SHEFFIELD



'A pleasing decorative scheme' is the passenger's first impression of the new L.N.E.R. Buffet car, which has been decorated exclusively in Mural 'Rexine,' to the requirements of Sir Nigel Gresley, C.B.E., Chief Mechanical Engineer. The L.N.E.R.'s confidence in Mural 'Rexine' as a wall covering and 'Rexine' leathercloth for seating is well-founded, based on long experience. 'Rexine' is distinctive, durable and easily cleaned—the best possible decorative material for modern railway interiors. Write for patterns and full particulars.

MURAL 'REXINE'

Brand

ICI (REXINE) LTD., HYDE, CHESHIRE London Office: 60 Wilson St., Finsbury, EC2

"Rexine" is a registered trade mark, the property of I.C.I. (Rexine) Ltd., a subsidiary company of Imperial Chemical Industries Ltd.

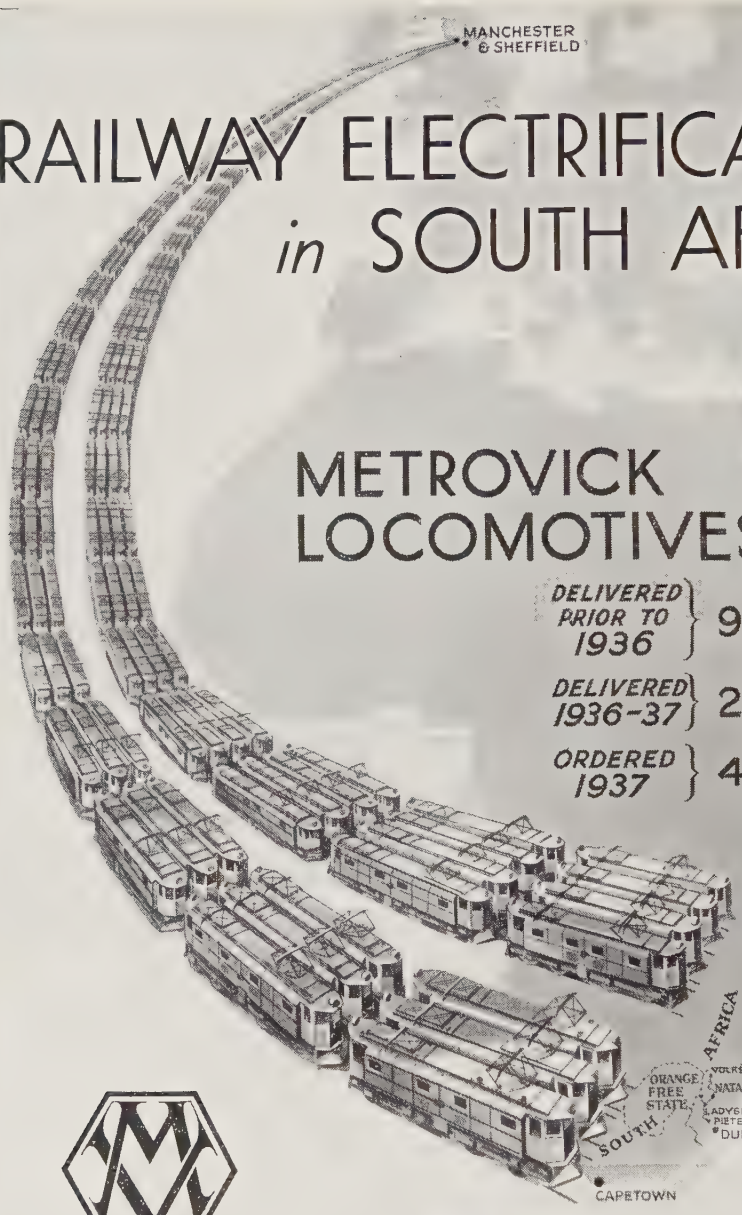
R.A.586

RAILWAY ELECTRIFICATION *in* SOUTH AFRICA

MANCHESTER & SHEFFIELD

METROVICK LOCOMOTIVES

DELIVERED PRIOR TO 1936	95
DELIVERED 1936-37	25
ORDERED 1937	42



ASSOCIATED ELECTRICAL INDUSTRIES LTD. AEI

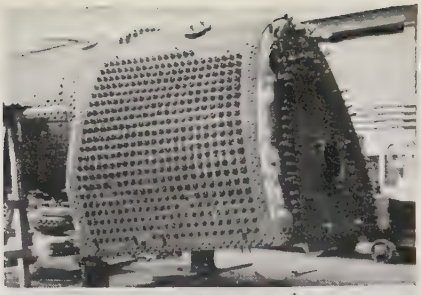
METROPOLITAN Vickers ELECTRICAL CO., LTD.

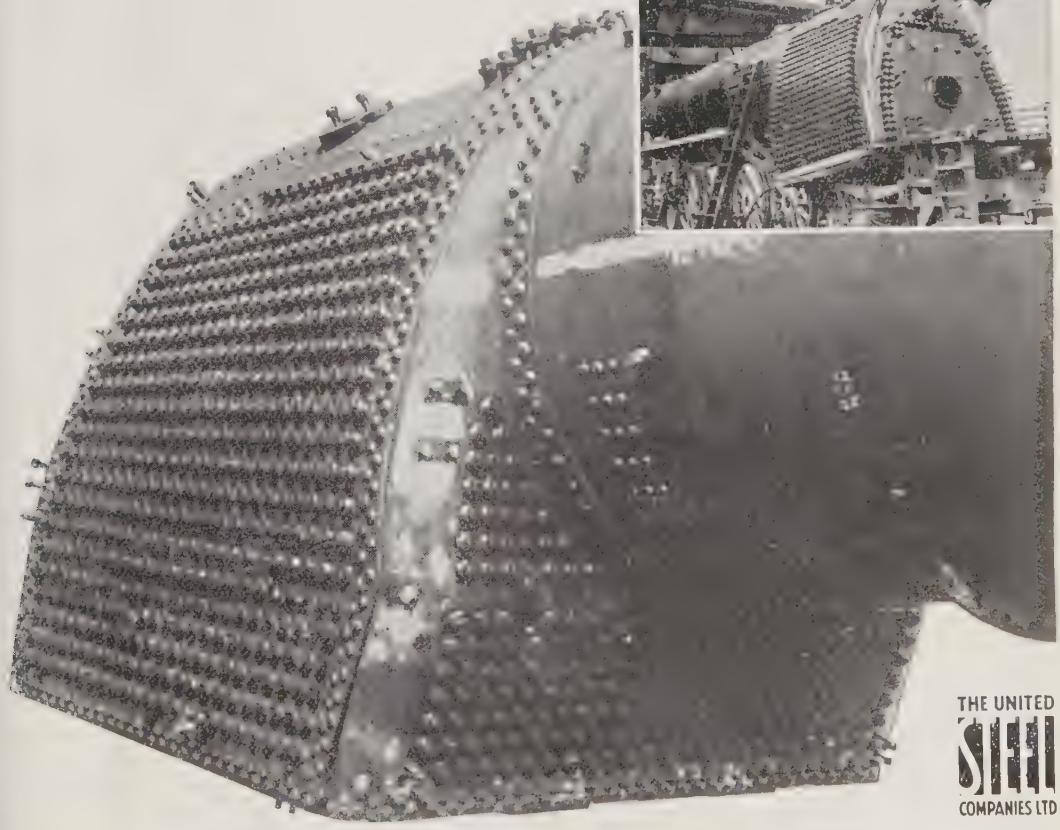
TRAFFORD PARK ··· MANCHESTER 17.

"DuNic" Staybolt Steel

"DuNic" has all the ductility of best Wrought Iron, gives superior impact tests, offers greater fatigue strength, and resists strain-age embrittlement. It rivets easily, does not harden unduly in flame cutting, and is homogeneous and consistent in quality.

The illustrations show "DuNic" in use for a locomotive recently built for Sao-Paulo-Parana Plantations Ltd. (W. G. Bagnall Ltd.) and also for a locomotive for the South African Railway and Harbours (Robert Stephenson & Co. Ltd.) to the design of Mr. A. G. Watson, Chief Mechanical Engineer.



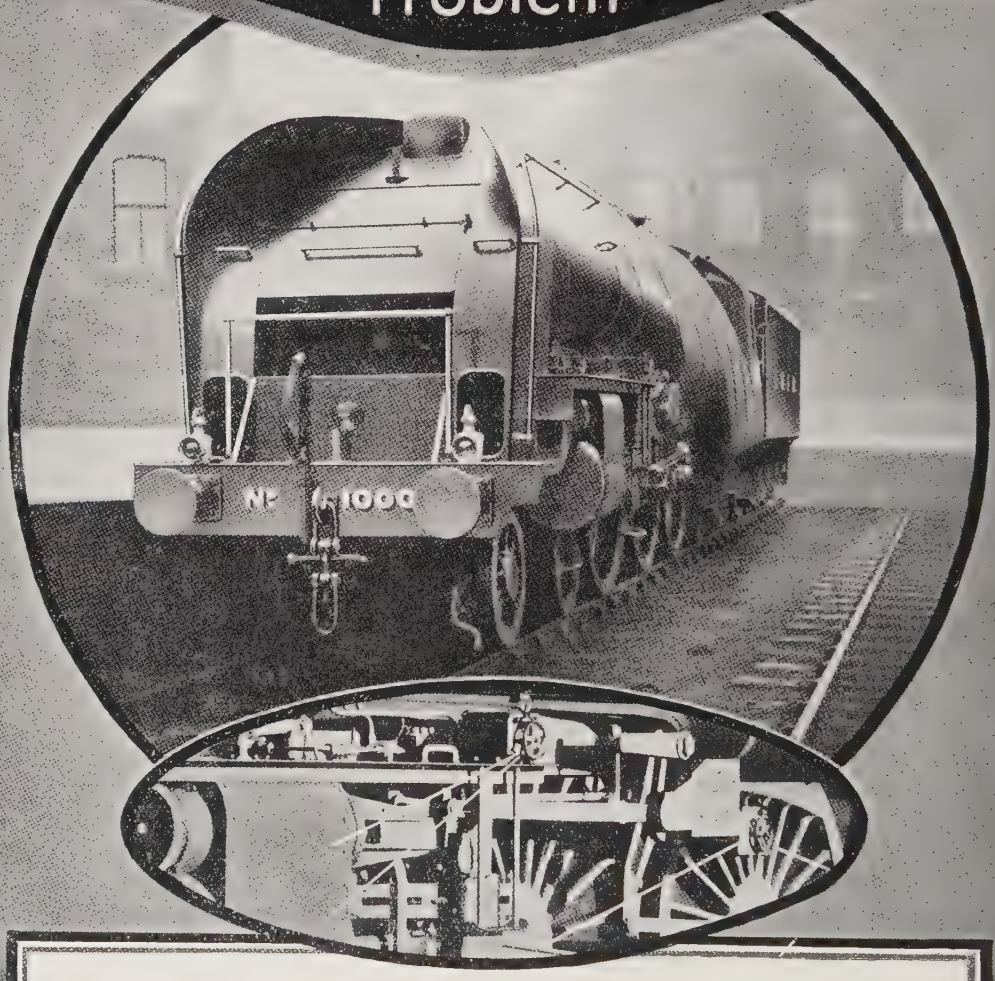


THE UNITED STEEL COMPANIES LTD

SAMUEL FOX & CO. LTD., STOCKSBRIDGE, SHEFFIELD, ENG.

Associated with The United Steel Companies Limited

High Pressure Steam
-and the Lubrication Problem



THE L.N.E.R. 4- CYLINDER COMPOUND EXPRESS LOCOMOTIVE depicted above, fitted with high pressure Yarrow-Gresley boiler is equipped with WAKEFIELD No 7 pattern Mechanical Lubricators for valves, cylinders and axleboxes. One of the principal and most difficult problems associated with the use of steam at very high pressures in locomotives is that of lubricating the cylinders and piston valves; whilst for heavily loaded bearings forced lubrication has become a necessity. WAKEFIELD'S Mechanical Lubricators adequately meet both requirements.

C. C. WAKEFIELD & CO., LTD.

WAKEFIELD HOUSE, 30-32, CHEAPSIDE, LONDON, E. C. 2

'ENGLISH ELECTRIC'

DIESEL - ELECTRIC TRAINS
for CEYLON

The illustration shows one of the 4 - coach articulated Diesel-electric trains constructed by The English Electric Company for the Ceylon Government Railways.

Complete Railway Electrification Schemes Undertaken in any part of the World.

THE ENGLISH ELECTRIC COMPANY LIMITED

Registered Office: QUEEN'S HOUSE, KINGSWAY, LONDON W.C.2

WORKS: STAFFORD · BRADFORD · RUGBY · PRESTON

BRANCH OFFICES AND ASSOCIATES ABROAD :

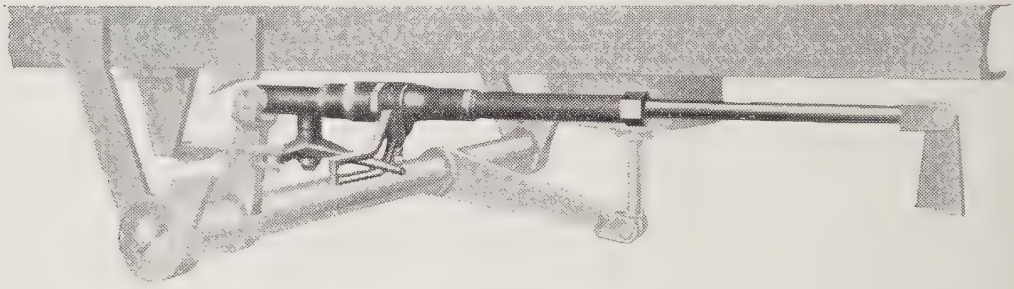
ARGENTINA, AUSTRALIA, BRAZIL, CANADA, CEYLON, CHILE, CHINA, DENMARK, EGYPT, ICELAND, INDIA, JAPAN, MALAYA, NEW ZEALAND, RHODESIA, SOUTH AFRICA, WEST INDIES, YUGO-SLAVIA.

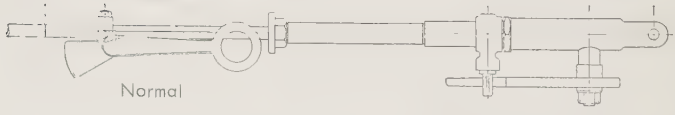
BRAKES ADJUSTED AUTOMATICALLY

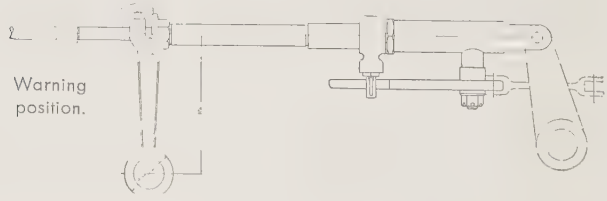
BRAKE SLACK ADJUSTERS

included in modern brake rigging design ensure economy in maintenance costs and is essential to the braking operation efficiency of every type, design and gauge of passenger and goods vehicle, fitted with VACUUM, AIR or Hand Brakes.

"Gresham-Dabeg" mechanism being totally enclosed, its greased packed ratchet and pawl cannot become clogged.







A Constant Piston Stroke is maintained and this ensures : —

- Maximum Power from Cylinder.
- Even Brake Block pressure at all times.
- Maximum Efficiency from Rigging.
- Minimum Quantity of Air to be admitted and extracted.
- Full Hand Brake application.
- Smooth and efficient brakes.

EXCLUSIVE FEATURES INCLUDE : —

Extreme ease of application.
Exceptionally light and compact.
Fool proof setting.
Automatically takes up slack on release stroke.
Independent Automatic resetting indicator may be fitted separately if desired
Continuous fine adjustments are automatic.
Simplicity of maintenance.
No special suspension required.

HEATLY & GRESHAM LTD

40, WOOD STREET, WESTMINSTER, LONDON, S.W.1

Phone No. : ABBey 5964. Sole Licensees : British Empire, South America, etc. *Telegrams* : Excluding Sowest, London.

Write for List 20

GRESHAM & CRAVEN LTD

ORDSALL LANE SALFORD · MANCHESTER · 5

Phone No. : BLAckfriars 6316. MANUFACTURERS. *Telegrams* . Brake Phone, Manchester.

London Office : 40, WOOD STREET, WESTMINSTER, LONDON, S.W.1

Distributors for :
Northey-Boyce Patent Rotary Exhausters for Railway Braking.

WITH

VICKERS

"VI" SINGLE BATTERY SYSTEM

for Electric Lighting of Trains

VICKERS TRAIN LIGHTING CO., LTD

VICKERS HOUSE, BROADWAY, LONDON, S.W.1

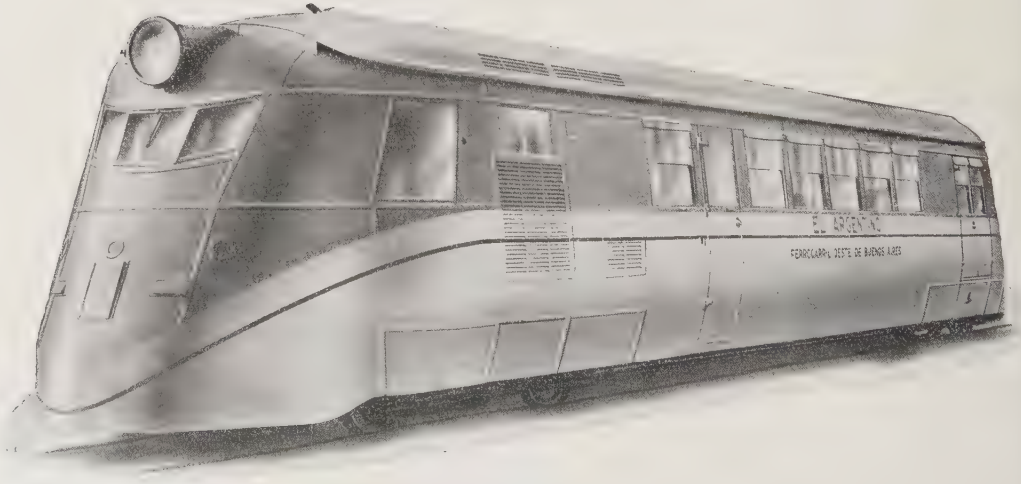
The Birmingham Railway Carriage & Wagon Co. Ltd.

London Office
10, Mayfair Place, W.1

Head Office
Smethwick-England

has under construction in its shops a large number of Diesel Engined Stream-Lined Rail Coaches of various types.

The illustration shewn below is of one of two **Diesel Electric All Metal Light Weight Rail Cars** designed and built by the Company, under the direction of Messrs. Livesey & Henderson, for The Buenos Ayres Western Railway.



HOFFMANN

HOFFMANN

ROLLER BEARING
AXLE BOXES

are used on the TRAILER and MOTOR TRAILER axles for the L.M.S. (WIRRAL) Electrification scheme.

More and more Hoffmann Boxes are being used. They are reliable, cost practically nothing for upkeep and eliminate hot boxes. Their design is distinctive for its simplicity, allowing of easy mounting and dismounting.

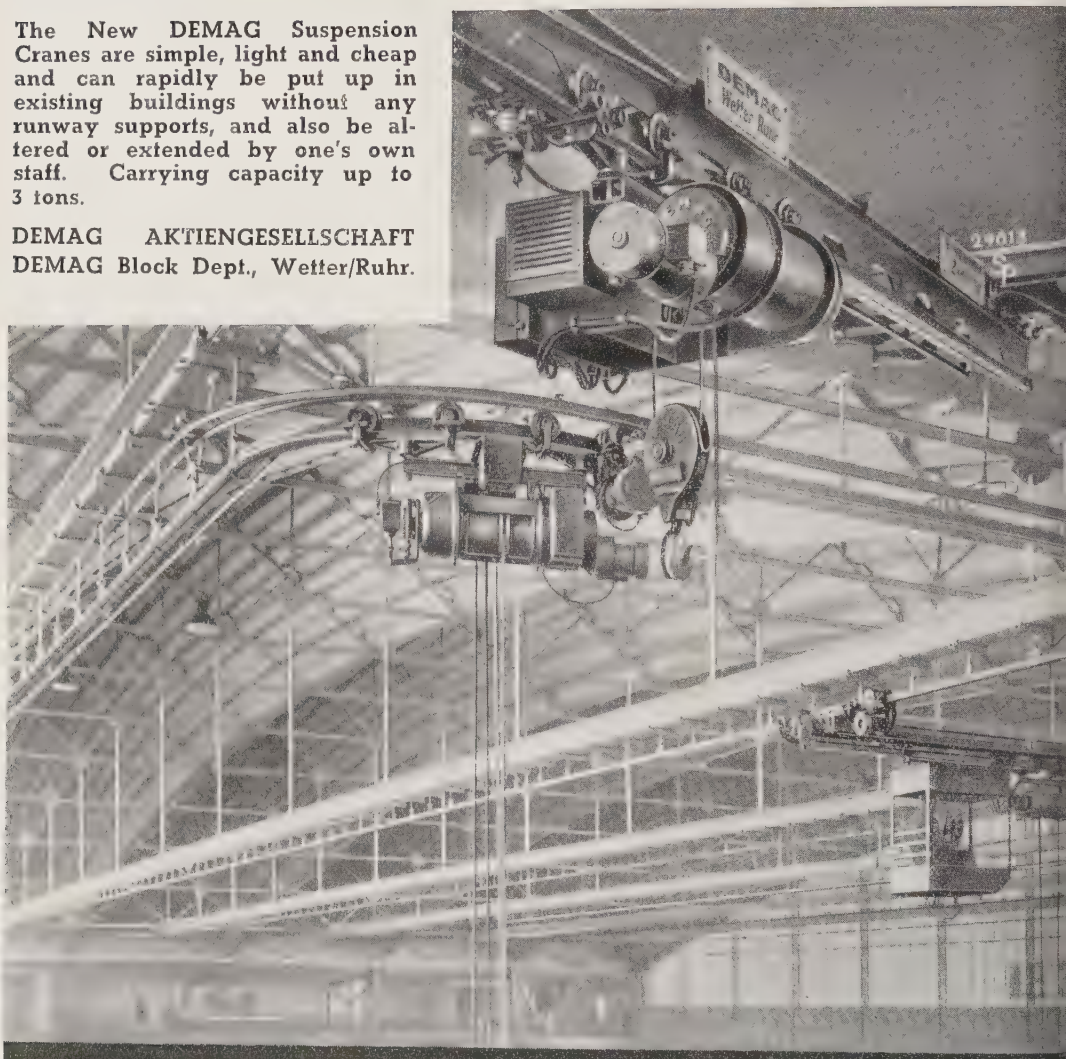
May we collaborate?
THE HOFFMANN MFG. CO. LTD.,
CHELMSFORD, ESSEX.

BEARINGS

DEMAG SUSPENSION CRANES

The New DEMAG Suspension Cranes are simple, light and cheap and can rapidly be put up in existing buildings without any runway supports, and also be altered or extended by one's own staff. Carrying capacity up to 3 tons.

DEMAG AKTIENGESELLSCHAFT
DEMAG Block Dept., Wetter/Ruhr.



DEMAG
DUISBURG

Agencies :

Great Britain : Aabacas Engineering Co., Ltd., Grange Road, **Birkenhead.**
France : Henry Hamelle, 21-23, boulev. Jules Ferry, **Paris (XI^e).**
Belgium : Ing. A. Rosengarde, 195-197, avenue de la Couronne, **Brussels.**
Italy : DEMAG Soc. An. Italiana, Via Ugo Bassi 3, **Milan.**
Spain : Rodolfo Schmitz, Apartado 494, **Bilbao.**
Switzerland : Ing. H. Bäumlin, Murbacher Str. 3, Postfach, **Luzern.**
German-Austria : Obering. J. Kroschel, **Vienna IV,** Brucknerstr. 6.

SOLID

FORGED AND ROLLED STEEL

WHEELS

TYRES, AXLES & DISC CENTRES

FOR
LOCOMOTIVES
CARRIAGES & WAGONS

TAYLOR BROS
& COMPANY LIMITED
TRAFFORD PARK STEEL WORKS, MANCHESTER.

London Office:
VICKERS HOUSE, BROADWAY,
WESTMINSTER, ——— S.W. 1.

MODERN TRAFFIC
REQUIRES
MODERN TRACK

•

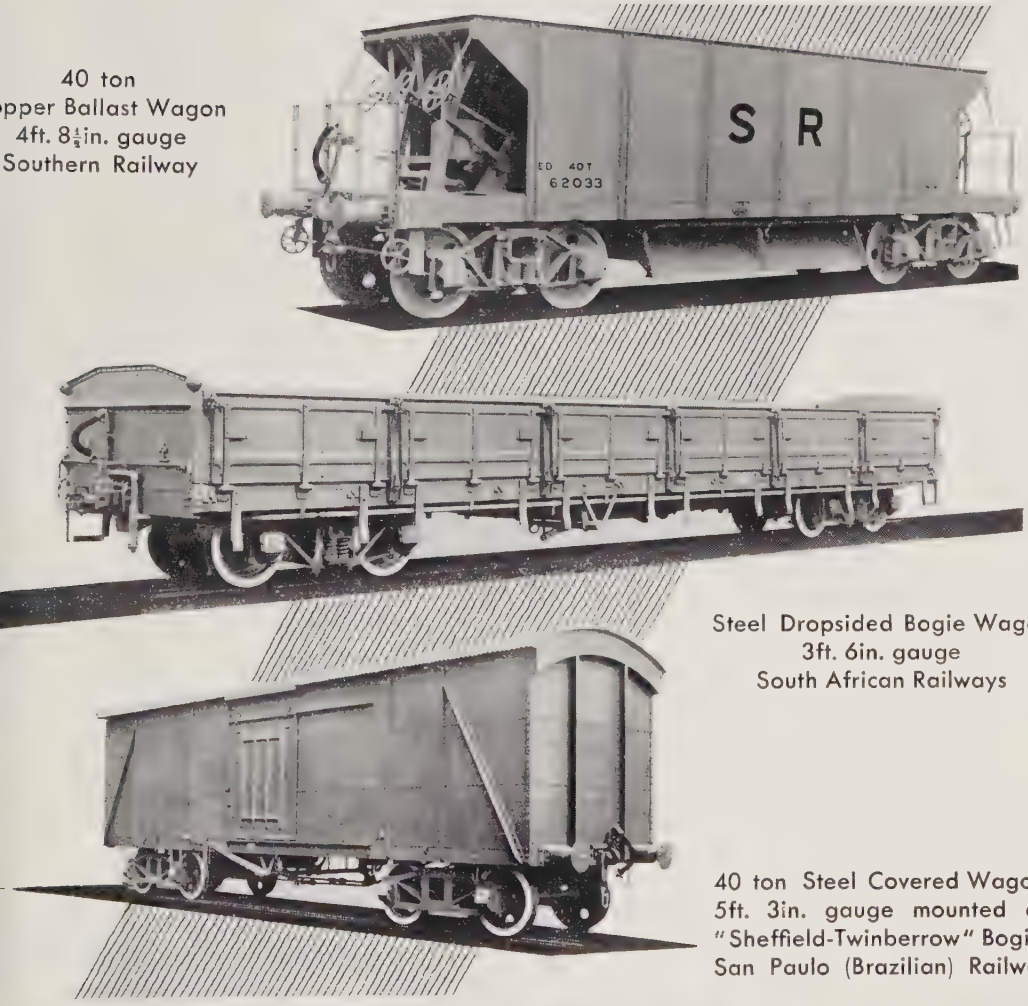
PERFECT SECURITY
for heavy traffic
and high speeds

•

no bolts · no loosening
no up-keep
an always accurate gauge

THE STEEL SLEEPER
SALES MONOPOLY: SOCIÉTÉ COMMERCIALE D'OUGRÉE AT OUGRÉE
OUGRÉE-MARIHAYE PATENT

Designers & Builders of
RAILWAY WAGONS
of all types



40 ton
pper Ballast Wagon
4ft. 8½in. gauge
Southern Railway

Steel Dropsided Bogie Wagon
3ft. 6in. gauge
South African Railways

40 ton Steel Covered Wagon.
5ft. 3in. gauge mounted on
"Sheffield-Twinberrow" Bogies
San Paulo (Brazilian) Railway

METROPOLITAN-CAMMELL
CARRIAGE & WAGON Co LIMITED
Head Office: SALTLEY, BIRMINGHAM. London Office: VICKERS HOUSE, BROADWAY, WESTMINSTER, S.W.1.

AIR CONDITIONING EQUIPMENTS

NEW AND for EXISTING RAILWAY STOCK BROAD OR NARROW GAUGE IN ANY PART OF THE WORLD

The manufacture by J. Stone & Company of Railway Carriage Air Conditioning Equipments, is a logical development arising out of their extensive experience in the manufacture of axle-driven electrical equipment for Railway Rolling Stock — for Lighting, Cooking, Heating, Ventilation and Refrigeration.

They have made a very special study of the application of Air Conditioning to railway vehicles and their equipments are giving satisfactory service in various parts of the world.

J. STONE & CO. LTD.

DEPTFORD · LONDON · ENGLAND

JOHN COCKERILL'S SHIPYARD

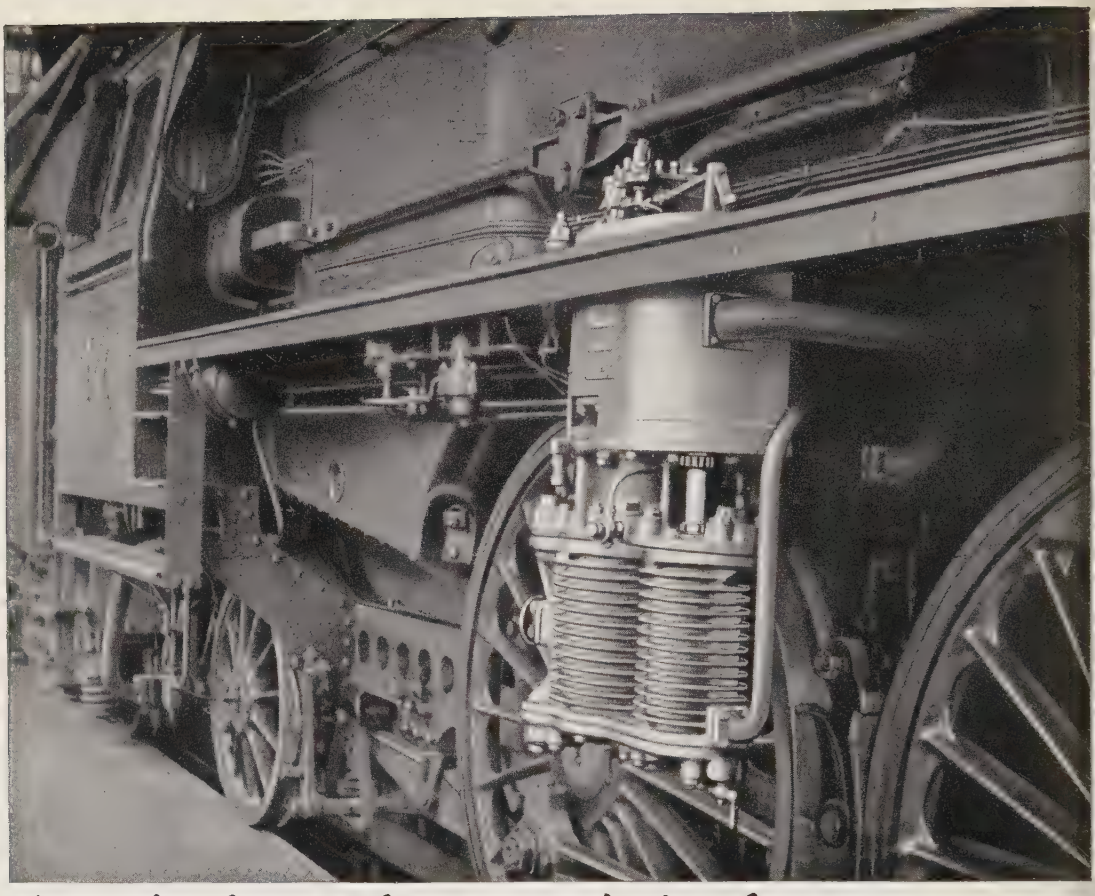
HOBOKEN

BELGIUM

M. S. "PRINS ALBERT" THE FASTEST MOTORSHIP AFLOAT

CROSS - CHANNELS and FERRIES

A SPECIALITY



Knorr's Cross-Compound Air Compressors

Air brakes need reliable air supply. The cross-compound air compressor with steering mechanism type Nielebock (patented) has proved its value many thousand times.

The advantages are: troublefree working — smooth and noiseless running — high performance with little steam consumption and high volumetric efficiency — compact design and small weight.

The air compressor delivers 106 cu. ft. per minute of air sucked-in against pressures up to 147 lbs. per sq. inch. Economically lubricated by a pump working in accordance with the number of piston strokes. Easily interchangeable and automatically adjustable metal stuffing boxes for piston rods in steam- and air portion. Handy located and massless air valves.

A governor cuts out the compressor as soon as working pressure is reached in main reservoir, and cuts in on the slightest drop in reservoir pressure.

KNORR-BREMSE
A-G BERLIN O 112

Bulletin of the International Railway Congress Association

CONTENTS OF THE NUMBER FOR JUNE 1938.

8 656

of the Int. Ry. Congress Ass^on, No. 6, June, p. 551.

cts of the world crisis and road competition on ilway position. Corresponding changes in rail-y commercial policy. (Subject X, 13th Con-. — *Discussion.* (33 000 words & graphs.)

8 385 .57

of the Int. Ry. Congress Ass^on, No. 6, June, p. 602.

ction, orientation and instruction of railway (Subject XI, 13th Congress). — *Discussion.*) words.)

8 625 .61 (01

of the Int. Ry. Congress Ass^on, No. 6, June, p. 620.

ordination of operation as between main-line ght railways (Subject XII, 13th Congress). — *ssion.* (10 000 words.)

8 625 .611 & 656 .27

of the Int. Ry. Congress Ass^on, No. 6, June, p. 632.

cifications for the fixed plant of railways with raffic, intended to prevent the use of unneces-expensive track equipment, and generally to economical working (Subject XIII, 13th Con- — *Discussion.* (7 000 words.)

3 625 .14 (01 & 625 .212

f the Int. Ry. Congress Ass^on, No. 6, June, p. 642.

CHER (Alexander). — **A « circle-nomogram » e « axle-spacing » formulæ** of the Union of l European Railways. (1 500 words & fig.)

3 656 .222.5

f the Int. Ry. Congress Ass^on, No. 6, June, p. 645.

OOGHT (R. L.). — **Alinement chart for the ination of the loss of time of passengers trains,** reduction of speed, on the level. (2 000 words

1938 69

Bull. of the Int. Ry. Congress Ass^on, No. 6, June, p. 651.

KARSEN (A.). — The « Joosten » process of **consolidating and sealing permeable soil.** (1 400 words & fig.)

1938 385. (02

Bull. of the Int. Ry. Congress Ass^on, No. 6, June, p. 655.

NEW BOOKS AND PUBLICATIONS. — **Alphabetisches Ortsverzeichnis** (früher Dr. Koch's Ortsverzeichnis). [*Alphabetical List of Places* (former Dr. Koch's List)]. Twentieth Edition. Published by the CENTRAL EUROPEAN RAILWAYS ASSOCIATION. (400 words.)

1938 625 .1 (02

Bull. of the Int. Ry. Congress Ass^on, No. 6, June, p. 655.

NEW BOOKS AND PUBLICATIONS. — **Elsners Taschenbuch für den Bautechnischen Eisenbahndienst** (*Elsner's Permanent-Way Handbook,* 1938, 16th year. (350 words.)

1938 621 .13 (02 (.43), 621 .138.5 (02 (.43) & 625 .26 (02 (.43)

Bull. of the Int. Ry. Congress Ass^on, No. 6, June, p. 656.

NEW BOOKS AND PUBLICATIONS. — **Elsners Taschenbuch für den Werkstätten und Betriebs-Maschienendienst bei der Deutschen Reichsbahn** (*Elsner's Handbook for the locomotive and rolling stock department and repair shops of the German State Railways*). (450 words.)

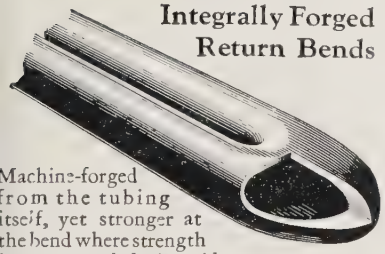
Alphabetical Index of Advertisers

Firms:		Specialities:
Anglo-Franco-Belge, S. A.	—	Locomotives and Railway rolling stock.
Anti-Attrition Metal Co. (The)	—	Bronzes and white bronzes for railway purposes.
Armstrong Oiler Co., Ltd. (The)	XXV	Lubricators.
Associated Equipment Co., Ltd. (The)	—	Passenger and commercial motor vehicles.
Ateliers de Constructions Electriques de Charleroi	—	Electric train lighting. Electric signalling.
Ateliers de Construction de la Meuse	XXVI	Locomotives.
Ateliers de la Dyle	—	Railway and Tramway rolling stock
Ateliers Gamain	—	Precision mechanics.
Ateliers Métallurgiques	—	Locomotives, Railway and Tramway rolling stock
Baume et Marpent	—	Railway and Tramway rolling stock.
Bayliss, Jones & Bayliss, Ltd.	—	Railway fastenings, rail screws, etc.
Birmingham Ry. Carriage & Wagon Co.,	XIII	Railway rolling stock.
Bonnel (1924), Ltd. (W. A.)	—	Cemented waterproof. Sleepers, crossings, etc.
Brugeoise et Nicaise & Delcuve (La)	—	Railway rolling stock and fixed equipment.
Chloride Electrical Storage Co., Ltd. (The)	—	Train lighting batteries.
Cockerill & Co. (John)	XX	Iron and steel in all forms.
Coltness Iron Co., Ltd.	XXVI	Locomotive steel castings.
Cowans, Sheldon & Co., Ltd.	III	Vacuum power locomotive turning gear.
Davies & Metcalfe, Ltd.	—	Injectors, ejectors, etc.
Demag, A. G.	XV	Special Cranes and Lifting Appliances.
Deutsche Getriebe	—	Mylius transmission for Railcars.
Docker Brothers	XXIX	Varnishes, Japans, Fine colours, etc.
English Electric Company, Ltd. (The)	X	Railway electrification.
Firth (Thos) & Brown (John), Ltd.	V	Hollow forgings. Tyres, axles, etc.
Gebrüder Credé & Co.	—	Railway Carriage & Wagon Works.
Gresham & Craven, Ltd.	XI	Mercury arc rectifiers.
Guest, Keen & Nettlefolds, Ltd.	XXVII	Screws.
Haine-St-Pierre (Forges, Usines et Fonderies de)	—	Railway rolling stock.
Henricot Steel Foundry (The)	—	Steel Castings for Railways.
Hoffmann Mfg. Co., Ltd. (The)	XIV	Bearings.
Kaye & Sons, Ltd. (Joseph)	XXVII	Seamless steel oil feeders.
Kearns & Co., Ltd. (H. W.)	—	Borers.
Knorr-Bremse, A. G.	XXI	Air brakes, feedwater heaters, etc.
Lightalloys, Ltd.	XXIX	Aluminium alloys in all forms.
Metropolitan Cammel Carriage Wagon & Finance Co., Ltd.	XVIII	Rolling stock of all kinds.
Metropolitan Vickers Electrical Co., Ltd.	VII	Railway-Electrification.
Nobel Chemical Finishes Ltd.	XXVIII	« Dulux » coach finishes.
Pritchett & Gold and E. P. S., Ltd.	—	Accumulators for train lighting.
Rexine, Ltd.	VI	Leathercloths.
« Sentinel » Waggon Works, Ltd. (The).	—	Locomotives. Rail cars, etc.
Société Commerciale d'Ougrée	XVII	Patented steel sleepers.
Spencer (J.) & Sons, Ltd.	—	Railway springs, axle forgings, etc.

Firms:		Specialities:
Spencer-Moulton & Co., Ltd. (George) .	XXXI	India rubber springs of all kinds.
Still & Sons, Ltd. (W. M.)	—	Kitchen and service equipment.
J. Stone & Co., Ltd.	XIX	Railway specialities of all kinds.
Superheater Company (The), London . .	—	Superheaters for locomotives and multiple valve regulator headers.
Superheater Company (The), New York.	XXIV	Steam superheaters for locomotives, marine, etc
Taylor Bros & Co., Ltd.	XVI	Wheels and axles.
Turton Brothers & Matthews, Ltd. . .	XXVIII	Timmis Double-Web spiral steel springs.
United Steel Companies, Ltd. (The) . .	VIII	Steel sleepers, steel for all purposes.
Vacuum Brake Co., Ltd.	—	Air brakes.
Vacuum Oil Company, Ltd.	—	Lubricants for locomotives.
Vereinigte Eisenbahn-Signalwerke . . .	IV	Railway signalling.
Vickers Train Lighting Co., Ltd. . . .	XII	Train lighting dynamos and equipment.
Vi-Spring Products, Ltd.	—	Seat springs.
Wakefield & Co., Ltd.	IX	Mechanical lubricators: oils for all purposes
Ward & Ltd.	—	Machine Tools.
Westinghouse Brake & Signal Co., Ltd.	II	Railway signalling. Brakes. Heating systems
Wild & Co. (A. G.)	—	Railway supplies, steam heating, etc.
Willford and Company, Ltd.	XXV	Railway springs and for all their purposes.

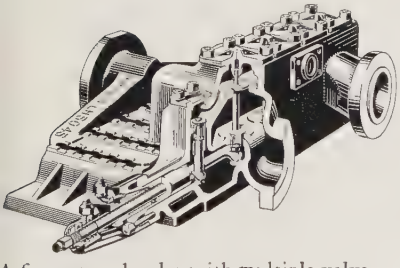
Serving *the* SUPERHEATING REQUIREMENTS *of the* WORLD'S RAILWAYS

Integrally Forged Return Bends



Machine-forged from the tubing itself, yet stronger at the bend where strength is most needed. Provides constant area through the bend, with smooth internal and external surfaces—avoiding restriction of steam through units or accumulation of soot, ashes or cinders.

Multiple-valve Throttle-headers



A finger-type header with multiple-valve throttle or regulator contained in the casting. Without changing smokebox arrangement this throttle-header offers distinct advantages: Steam is controlled between the superheater and cylinders; superheated steam is always available for auxiliaries; use of a series of small valves opening and closing consecutively gives better and quicker control of locomotive movements.

Through a coordinated service with associated organizations in Great Britain, France, Germany, the United States, Canada, and Australia, the railways of the world are served with locomotive superheating equipment, that conforms to a general standard of practice, yet is adapted to the particular requirements of each individual country.

A distinguishing characteristic of the locomotive superheaters manufactured by these associated companies is the exclusive use of return bends, integrally forged with the tubing to form the loops of the superheater elements or units. These bends are machine-forged without utilizing either additional material or a flux. Railroads the world over have standardized on locomotive superheaters with these integrally-forged return bends. They have been applied to more than 100,000 locomotives.

These associated companies, as a result of constant development and research, and interchange of combined experience in modern railroading, offer improved superheating equipment to meet the changing conditions of locomotive operation. An outstanding recent development, now being adopted rapidly for every class of locomotive service, is the multiple-valve throttle-header.

THE SUPERHEATER COMPANY

60 East 42nd Street, New York, N. Y., U. S. A.

ASSOCIATED COMPANIES:

The Superheater Company, Limited
Dominion Square Bldg., Montreal, CANADA

Compagnie des Surchauffeurs
Rue la Boëtie 3, Paris, FRANCE

ELESCO

The Superheater Company Limited
Bush House, Aldwych, London, W. C. 2, ENGLAND

Schmidt'sche Heissdampf-Gesellschaft, m. b. H.,
Rolandstrasse 2, Cassel-Wilhelmshöhe, GERMANY

The Superheater Company (Australia) Limited
Manchester Unity Building, 185 Elizabeth Street, Sydney, N. S. W.

Agencies Throughout the World

A-914

Telegraphic Address : OILER, YORK Code used : ABC 5th Edition Telephone : 2946

THE ARMSTRONG OILER Co, Ltd. YORK

Patentees and manufacturers of **The « ARMSTRONG » Oiler**

Silver Jubilee fitted throughout

For lubricating
All Types of Railway
and Tramway Journals

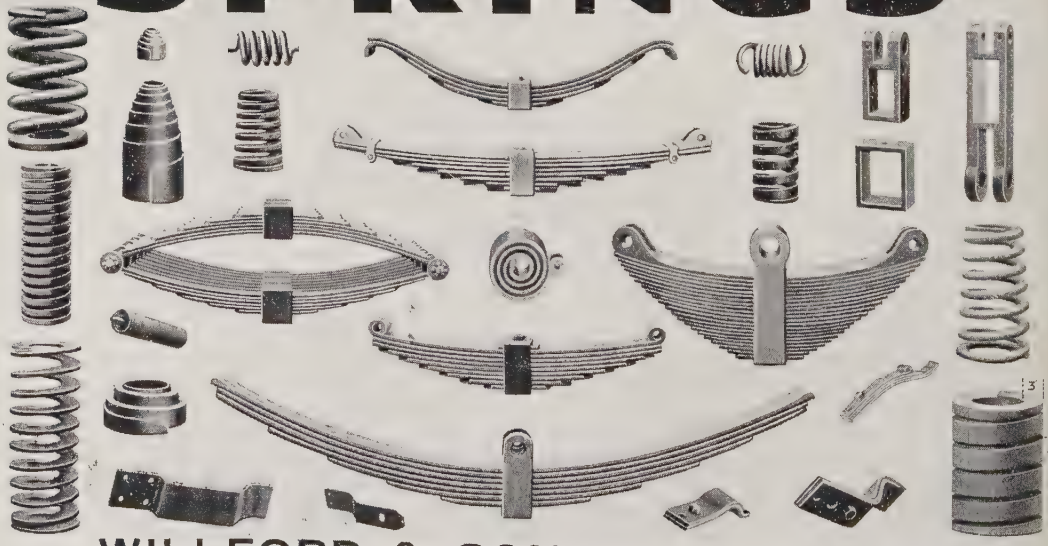
Efficient and Perfect
in Every Detail

WATER PROOF
OIL PROOF
DUST PROOF
FOOL PROOF

" ARMSTRONG OILER " fitted with Oil Seal for tip Wagon Axle Boxes

SAMPLE SETS FOR TRIAL SUPPLIED FREE OF CHARGE

SPRINGS



WILLFORD & COMPANY LIMITED,

ESTABLISHED 1890

PARK HOUSE WORKS, SHEFFIELD.

LONDON OFFICE.
34, Victoria Street,
Westminster, S.W.1.

Telephone: 21114 SHEFFIELD.
Telegrams: "AUDAX, 'PHONE, SHEFFIELD."
Code: BENTLEYS.

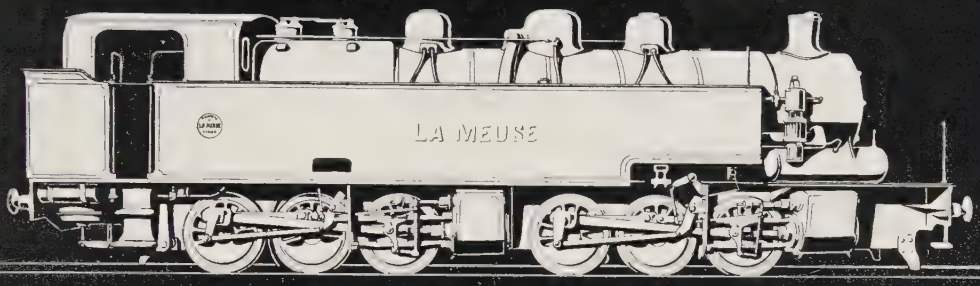
ALSO AT
BURNBANK WORKS,
DENNISTOUN, GLASGOW.

CONTRACTORS TO THE LEADING BRITISH, INDIAN, SOUTH AMERICAN AND COLONIAL RAILWAYS.
MODERN PLANT, SERVICES OF FIRST CLASS DESIGNING STAFF AVAILABLE.

SOCIÉTÉ DE LA MEUSE LIÉGE Fondée en 1835

ATELIERS DE LA MEUSE LIÉGE

FONDÉS EN 1835



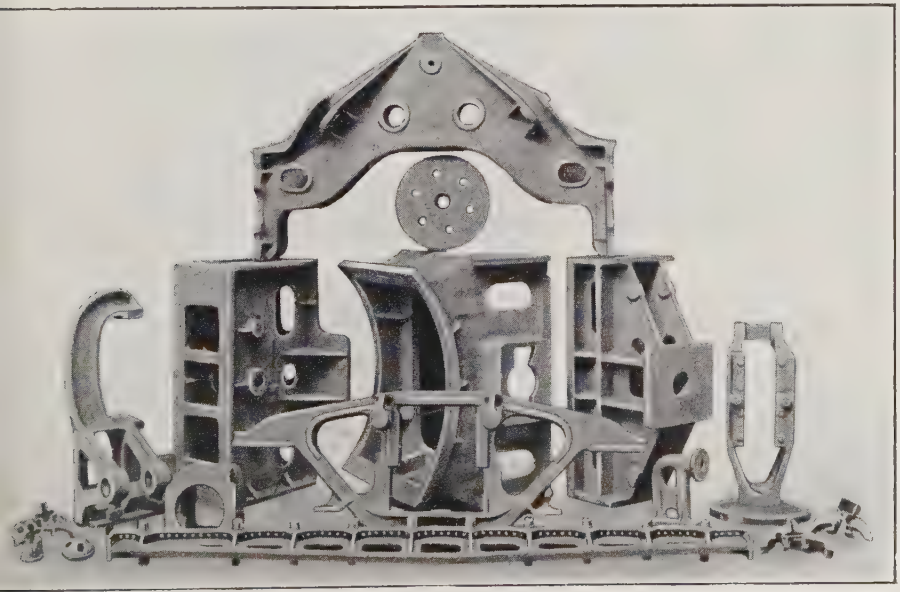
LOCOMOTIVES

COLTNESS IRON CO. LTD.

NEWMAINS, LANARKSHIRE, SCOTLAND.

WE SPECIALIZE IN LOCOMOTIVE STEEL CASTINGS

heel Centres, Domes, Piston Heads, Horn Blocks, Axle Boxes, etc., of which we are the largest Makers in Great Britain.
Steel Castings up to 10 tons - Iron Castings up to 50 tons



9' 2'

WORKS
NEWMAINS
Telephones
212 - 213
214 - 215
WISHAW
Telegraphic Address
"COLTNESS"
NEWMAINS

HEAD OFFICE
36, Robertson St.
Glasgow, c. 2.
Telephone
Central
9584
Telegraphic Address
"COLTNESS"
GLASGOW

NDON OFFICE : 10, IDDESLEIGH HOUSE, WESTMINSTER S. W. 1

NETTLEFOLDS SCREWS

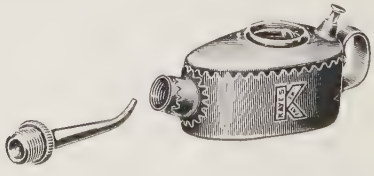
Standard quality all over the world

TRADE MARK

GUEST, KEEN & NETTLEFOLDS, LIMITED,
BIRMINGHAM -- ENGLAND

Kaye's patent automatic wedge locks cabinet locks etc., fitted throughout on the new high speed trains put in service on the L. & N. E. Railway.

Also makers of Kaye's patent seamless steel oil feeders torch lamps, etc.

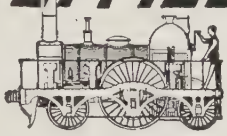


JOSEPH KAYE & SONS LTD.

Lock Works, Leeds 10 & 93, High Holborn, London W.C.1.
Established 1864

TURTON BROTHERS & MATTHEWS, LIMITED.

SHEFFIELD

TRADE  MARK

PILOT

SOLE-MAKERS OF THE

TIMMIS' DOUBLE-WEB

High-class steel springs for all purposes

The « **PILOT BRAND** » springs are made only of the highest quality of material. The greatest skill is used in their manufacture. They are finished with the greatest accuracy. They are made in **SHEFFIELD**

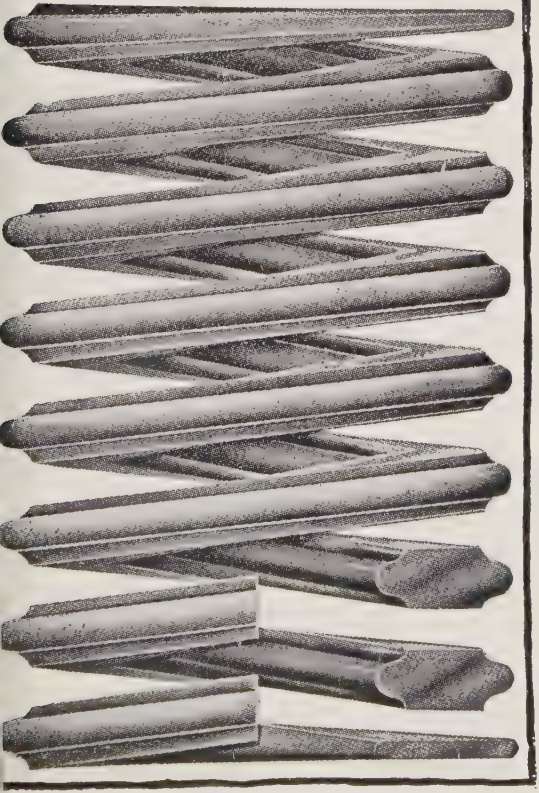
They will outlast any other springs as has been proved by over 50 years of experience.

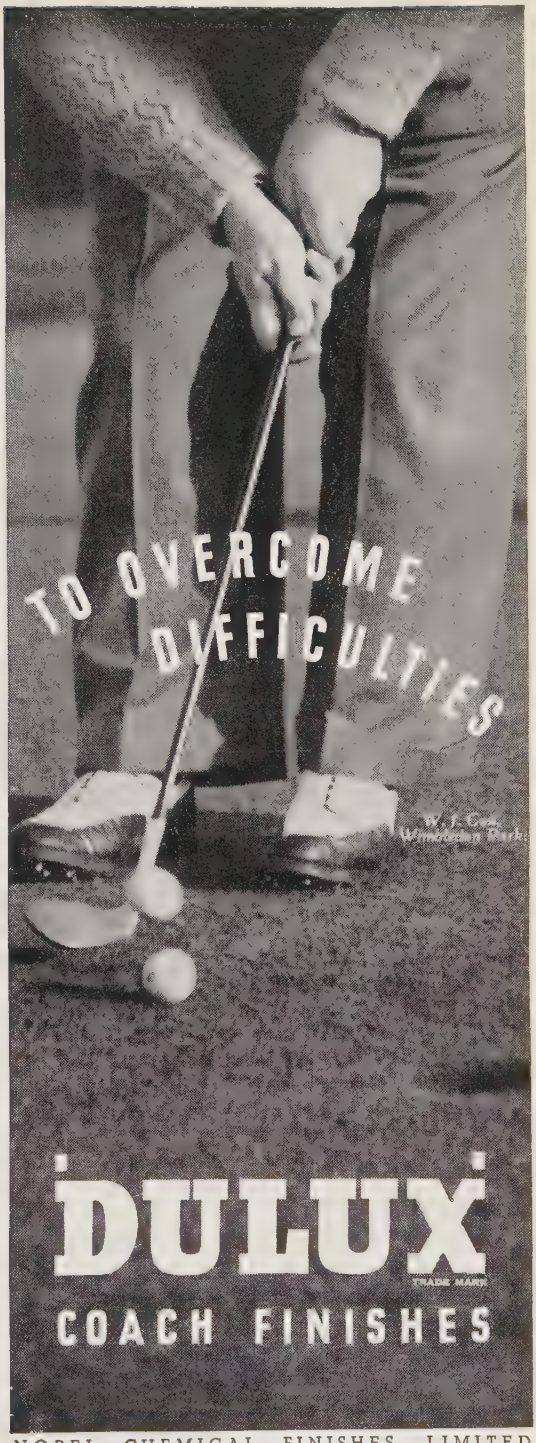
Instances have been brought to our notice of springs being in service for over 30 years, and even then some were unbroken.

These springs are, therefore, suitable for Railway Rolling Stock where a very high standard is insisted on. They are especially suitable for Carriage Bolster Bearing Springs where ease and steadiness in running as well as reliability are essential.

They are in use on the **LONDON & NORTH EASTERN RAILWAY, LONDON MIDLAND & SCOTTISH RAILWAY** and **SOUTHERN RAILWAY** and many other Railways.

The famous Silver Jubilee Train of the **L. & N. E. R.** is fitted throughout with these springs.



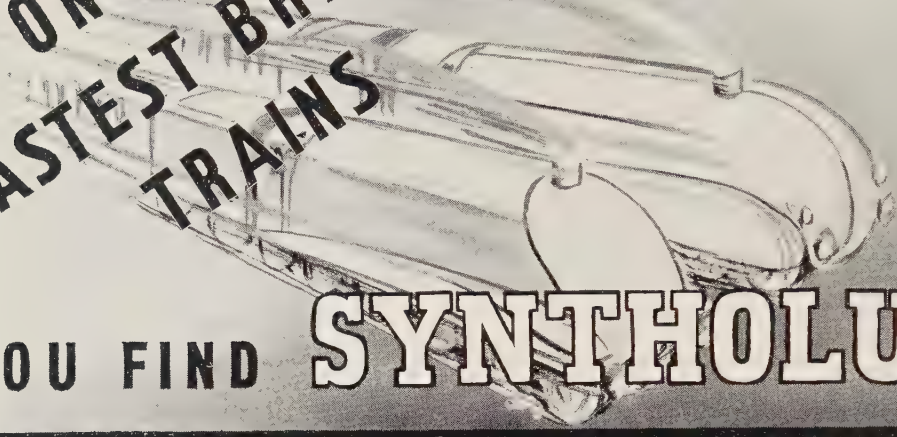


NOBEL CHEMICAL FINISHES LIMITED
(Associated with Imperial Chemical Industries Ltd.)
Industrial Section 10
NOBEL HOUSE, BUCKINGHAM GATE, LONDON, S.W.1

D.I.441

Silver Jubilee
Coronation
Coronation Scot
West Riding Limited

ON THE FASTEST BRITISH TRAINS



YOU FIND SYNTHOLUX

DOCKER BROTHERS LADYWOOD BIRMINGHAM 16

ALPAX
MODIFIED ALUMINIUM SILICON ALLOY

TRACTION MOTOR GEAR CASES

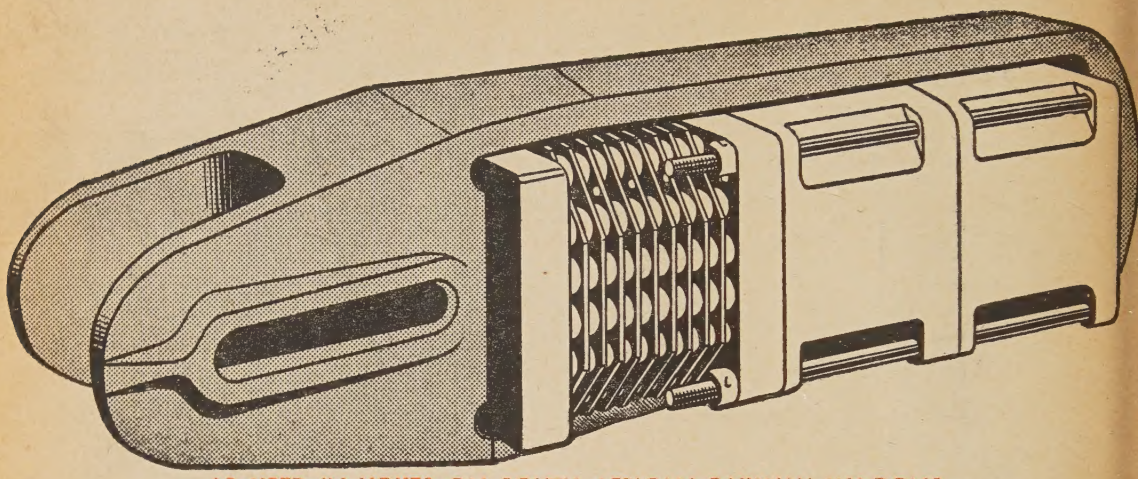
PATENT NO. 407,432

ALPAX WORKS
ST. LEONARDS ROAD,
WILLESDEN JUNCTION LONDON N.W.10
Telephone: WILlesden 3460-1-2
Telegrams: Lytalloys Phone London

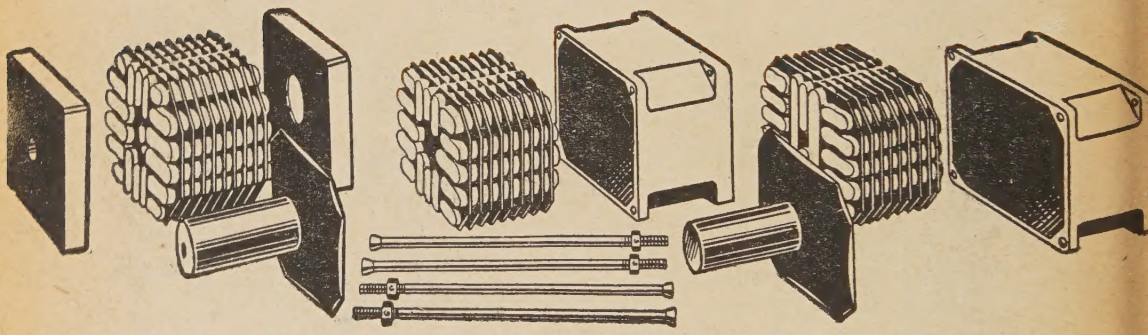
LIGHTALLOYS LIMITED

SPENCER-MOULTON

PATENT DRAFT GEAR



AS USED IN YOKES ON SOUTH AFRICAN RAILWAY WAGONS



RUBBER SPRINGS WITH STEEL PARTS BEFORE ASSEMBLY

GEORGE SPENCER MOULTON & CO., LTD.,

2, Central Buildings, Westminster, London, S. W. 1

SOCIÉTÉ FRANÇAISE DES CAOUTCHOUCS SPENCER MOULTON

11, rue du Gazomètre, Rueil (S. & O.)

Argentina : Percy Grant & Co. Ltd., Edificio Britanico, Calle Reconquista 314, Buenos Aires(1)
Belgium : J. Galler, L, rue de la Science, Brussels
Brazil : M. Almeida & Co., rua Boa Vista, 10, Sao Paulo
Denmark : A/S Frichs, Post Box No. 115, Aarhus
Holland : Koopman & Co., Gebouw « Atlanta » Stadhouderskade, 6, Amsterdam W.
India : George Spencer Moulton & Co. (India) Ltd., 8, Esplanade East, Calcutta
Sweden : Svenska Ackumulator Aktiebolaget Jungner, Riddargatan 17, Stockholm 7
Switzerland : O. L. Borner, Limmatquai, 3, Haus Bellevue, Zurich 1.

M. WEISSENBRUCH
S. A. -- BRUXELLES